SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract Documents, including General and Supplementary Conditions and other Division 01 and Technical Specifications, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

2. Bidders are required to provide numerical cost amounts for all alternates listed to reflect the cost associated with the Contract being bid. If an alternate bid does not pertain to a particular Contract or if there is no cost associated with the alternate, Bidders may input either "zero" or "no change" in that space.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted or rejected. Include a complete description of negotiated modifications to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

Alternate No.1 Replace Water Heaters: State amount to be "ADDED TO" the base bid to replace all existing water heaters including all accessories, equipment, incidentals, associated piping, controls, power, drainage, etc. and associated costs for a complete installation as indicated, shown and specified.

Alternate No.2 Plastic Laminate Cabinetry: State amount to be "ADDED TO" or "SUBTRACTED FROM" the base bid to provide and install new plastic laminate cabinetry in all kitchens and bathrooms including but not limited to, all accessories, hardware, countertops, filler panels, incidentals, etc. in lieu of the new modular modular casework shown.

END OF SECTION 012300

SECTION 024115 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Provide all removal, proper and legal disposal work as required to complete selective demolition work and prepare existing areas for new work required including, but not limited to, the following:

1. Demolition, removal and legal disposal off-site of selected portions of the building, construction assemblies, and other incidental work, whether shown or not shown, but required to complete the installation of scheduled work, coordinated with other trades and construction components being replaced by new construction.
2. Patching, repairing and replacing areas damaged or altered by demolition work, with new materials and construction similar in kind unless otherwise indicated.
3. Removal and relocation of salvageable equipment as directed by the Owner.

B. Coordination with Owner's continuing occupation and use of portions of the building. Maintain safe emergency access to and from the facilities at all times.

C. The existing building fire protection system shall not be diminished.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

A. Owner reserves first right of refusal for removal and salvage items. Items indicated for removal and salvage remain the Owner's property. Remove, clean, and pack items to protect against damage and deliver to Owner's designated storage area with labels to identify contents of containers. Demolished materials shall become the Contractor's property and removed from the site with further disposition at the Contractor's option.

1.5 SUBMITTALS

A. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
2. Use of stairs.
3. Locations of proposed dust- and noise-control temporary partitions and means of egress.
4. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work and with Owner's reduced usage during summer months to ensure uninterrupted operation of Owner activities and public safety.
5. Means of protection for items to remain and items in path of waste removal from building.

A. Pre-Demolition Photographs or Videotapes: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by selective demolition operations. Submit before Work begins.

1.6 PROJECT CONDITIONS

A. Occupancy: Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted. Provide minimum of 3 working days advance notice to Owner of demolition activities that will impact Owner's normal operations.

B. Protections: Provide temporary barricades and other forms of protection as required to protect occupants and general public from injury due to selective demolition work.

1. Provide protective measures required for assuring free and safe passage of all persons to and from occupied portions of building. Maintain exists in a manner that is acceptable to the Local Building Official.
2. Use utility and material locator equipment prior to cutting into existing construction to locate concealed utilities. By-pass or shut-off utilities anticipated to be near the demolition area.
3. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.
4. Protect floors, walls, ceilings, etc. with suitable coverings when necessary.

5. Construct temporary, insulated, solid, dustproof, partitions where required to separate areas where extensive dirt, dust, thermal and noisy operations are performed. Equip partitions with dustproof doors and security locks where passage is required.
6. Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces, and installation of new construction to insure that no water leakage or damage occurs to structure or interior areas of existing building. Provide insulated temporary weather protection at heated spaces that are required to remain heated.
7. Remove protections at completion of work.

C. Damages: Notify the Architect and Owner of any damages. Promptly repair damages caused to adjacent facilities by demolition work at no cost to Owner.

D. Traffic: Conduct demolition operations and debris removal in a manner to ensure minimum interference with pedestrian and vehicular access and exit routes as well as other adjacent occupied or used facilities.

1. Do not close, block or otherwise obstruct streets, parking areas, walks or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

E. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

F. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

1. Before selective demolition, Owner will remove loose furnishings (not built-in) files, text books, teaching props and the like.

G. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

H. Storage or sale of removed items or materials on-site is not permitted.

I. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

J. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Owner will remove hazardous materials under a separate contract.

PART 2 - PRODUCTS

2.1 REPAIRS

A. Use repair materials identical to existing materials to the fullest extent possible.

B. Where identical materials are unavailable or cannot be used for exposed surfaces, code or hazard issues, use code compliant materials that visually match and are compatible with existing adjacent surfaces, that are free of damage, defects, deterioration, as originally installed when new, to the fullest extent possible pending approval by the Architect.

C. Use materials whose installed performance equals or surpasses that of the existing materials as originally installed and complies with applicable codes.

2.2 NEW WORK AT EXISTING LOCATIONS

A. When new finishes are scheduled, indicated or required over existing substrates, Contractor shall completely remove existing finish materials, such as, but not necessarily limited to, veneers, coatings, films, oils, sealers, adhesives and other residual materials which are not acceptable substrates for new finishes per new finish manufacturer's written specifications and best industry standards whether specifically indicated or not. Defective substrates which are no longer uniform, dimensionally stable, structurally sound, or otherwise unacceptable for the installation of new finishes, shall be removed and replaced with new material compatible with existing and suitable for the new finish in accordance with material manufacturer's written literature and recognized industry standards. In all cases, consult material manufacturer's literature for new finishes to be installed prior to starting the work.

B. Accessory items and equipment, such as fire extinguishers, built-in cabinets, visual display boards, thermostats, switches, panels, exit signs, lights, drains, valves, unit ventilators and the like, located in walls, ceilings, roofs or floors to be altered or removed, shall be removed and salvaged for reconditioning and reinstallation and reconnection unless otherwise noted or directed by the Architect and at no additional cost to the Owner.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to commencement of selective demolition work, inspect areas in which work will be performed. Photograph or video tape existing conditions of structure, surfaces, equipment or to surrounding properties which could be misconstrued as damage resulting from selective demolition work; file a copy with Owner’s Representative prior to starting work.

B. Perform surveys as work progresses to detect hazards resulting from demolition activities.

C. Verify that utilities have been disconnected and capped.

D. When any unanticipated, mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigated and measure the nature and extent of the conflict. Promptly submit written report to the Architect.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Utility Services: Locate all utilities to remain, keep in service, and protect against damage during selective demolition operations.

B. Use utility and material locator equipment to locate utilities, structural elements etc. concealed within the building's construction.

C. When unanticipated mechanical, electrical or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a detailed written report to the Architect.

D. Existing building fire protection system shall not be diminished. Removal of existing devices shall not occur until the new equipment is in place and ready for the switchover.

E. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Owner's Facilities Manager will arrange to shut off indicated services/systems when requested by the Contractor.
2. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.
3. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to occupied areas of building. Provide minimum of 3 working days advance notice to Owner if shutdown of service is necessary during change-over.
4. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

    a. Contractor's scope of work includes, and the Contractor is required and expected to, patch any hole(s) resulting in the removal and/or capping of plumbing fixture(s) and/or piping in a wall, ceiling or floor to remain to match existing conditions, unless otherwise noted.

3.3 PREPARATION

A. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction
3. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
4. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
5. Cover and protect furniture, furnishings, and equipment that have not been removed.
6. Erect and maintain dust-proof partitions and closures as required preventing spread of dust or fumes to occupied portions of the building.

3.4 SELECTIVE STRUCTURE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
5. Maintain adequate ventilation when using cutting torches.
6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
7. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
8. Dispose of demolished items and materials promptly. On-site storage or sale of removed items is prohibited.
9. Return elements of construction and surfaces to remain to condition existing before start of selective demolition operations.
10. If unanticipated mechanical, electrical or structural elements are encountered that conflict with intended function or design, investigate and measure both nature and extent of the conflict. Submit written report to Owner’s Representative in accurate detail. Pending receipt of directive from Owner’s Representative rearrange demolition schedule as necessary to continue overall job progress without delay.

11. Promptly patch and repair holes and damaged surfaces caused to adjacent construction by selective demolition operations.
12. Where repairs to existing surfaces are required, patch to produce surfaces with the integrity and visual appearance of the original installation when it was new and suitable for new scheduled finish materials.
13. Restore exposed finishes of patched areas and extend finish restoration into adjoining construction to remain in a manner that eliminates evidence of patching and refinishing.
14. Patch and repair all surfaces in the newly created space(s) where demolition work extends from one finished area into another. Provide a flush and even surface of uniform stability, color and appearance.

    a. Closely match integrity, texture and finish of existing adjacent surfaces as when they were newly installed.
    b. Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
    c. Where patching smooth painted surfaces, extend final paint coat over entire unbroken surface containing the patch after the surface has received primer and first finish coat.
    d. Remove existing applied finishes over the entire unbroken surface area and replace with new materials, if necessary, to achieve uniform color and appearance.
    e. Inspect and test patched areas to demonstrate integrity of the installation, where feasible.

B. Patch or repair existing surfaces and finishes as necessary to provide an even-plane surface of uniform appearance.

C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.6 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024115

SECTION 035413 - GYPSUM CEMENT UNDERLAYMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes gypsum-cement-based, self-leveling underlayment for application below interior floor coverings.

1.3 ALLOWANCES

A. Furnish gypsum-cement-based underlayment as part of underlayment allowance.

B. Furnish and install gypsum-cement-based underlayment as part of underlayment allowance.

1.4 UNIT PRICES

A. Work of this Section is affected by underlayment unit price.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. LEED Submittals:

1. Product Data for Credit IEQ 4.2: For priming and sealing coatings, documentation including printed statement of VOC content.

C. Shop Drawings: Include plans indicating substrates, locations, and average depths of underlayment based on survey of substrate conditions.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Product Certificates: Signed by manufacturers of underlayment and floor-covering systems certifying that products are compatible.

C. Minutes of pre-installation conference.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Installer who is approved by manufacturer for application of underlayment products required for this Project.

B. Product Compatibility: Manufacturers of underlayment and floor-covering systems certify in writing that products are compatible.

C. Fire-Resistance Ratings: Where indicated, provide gypsum-cement underlayment systems identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

D. Sound Transmission Characteristics: Where indicated, provide gypsum-cement underlayment systems identical to those of assemblies tested for STC and IIC ratings per ASTM E 90 and ASTM E 492 by a qualified testing agency.

E. Preinstallation Conference: Conduct conference at [**Project site**] <**Insert location**>.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store materials to comply with manufacturer's written instructions to prevent deterioration from moisture or other detrimental effects.

1.9 PROJECT CONDITIONS

A. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ventilation, ambient temperature and humidity, and other conditions affecting underlayment performance.

1. Place gypsum-cement-based underlayments only when ambient temperature and temperature of substrates are between 50 and 80 deg F.

1.10 COORDINATION

A. Coordinate application of underlayment with requirements of floor-covering products and adhesives, to ensure compatibility of products.

PART 2 - PRODUCTS

2.1 GYPSUM-CEMENT-BASED UNDERLAYMENTS

A. Underlayment: Gypsum-cement-based, self-leveling product that can be applied in minimum uniform thickness of 1/8 inch and that can be feathered at edges to match adjacent floor elevations.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Maxxon_Corporation: Gyp-Crete [Gyp-Crete 2000] [Therma-Floor] [Dura-Cap] [Commercial Topping]. (Basis-of-Design)
b. CMP Specialty Products: Level-1 [H2-O] [210] [PourLite] [Mach-5].
c. Ardex Americas: V-1200 [K-15] [LT-65 Lite-Tech] [LU-100].
d. USG Corporation: Levelrock 2500 [Levelrock 3500] [Levelrock RH].

2. Cement Binder: Gypsum or blended gypsum cement as defined by ASTM C 219.
3. Compressive Strength: Not less than 2000 psi at 28 days when tested according to ASTM C 472.
4. Underlayment Additive: Resilient-emulsion product of underlayment manufacturer, formulated for use with underlayment when applied to substrate and conditions indicated.

B. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch; or coarse sand as recommended by underlayment manufacturer.

1. Provide aggregate when recommended in writing by underlayment manufacturer for underlayment thickness required.

C. Water: Potable and at a temperature of not more than 70 deg F.

D. Reinforcement: For underlayment applied to wood substrates, provide galvanized metal lath or other corrosion-resistant reinforcement recommended in writing by underlayment manufacturer.

E. Primer: Product of underlayment manufacturer recommended in writing for substrate, conditions, and application indicated.

1. Primer shall have a VOC content of 200 g/L or less when calculated according to 40 CFR 59, Subpart D.

F. Corrosion-Resistant Coating: Recommended in writing by underlayment manufacturer for metal substrates.

1. Coating shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D.

G. Sealer: Primer sealer product of underlayment manufacturer recommended in writing for sealing floor areas to receive glue down floor finishes.

1. Primer shall have a VOC content of 200 g/L or less when calculated according to 40 CFR 59, Subpart D.

2.2 ACCESSORIES

A. Sound Mat:

1. Maxxon_Corporation: Acousti-Mat I [Acousti-Mat II] [Acousti-Mat III] [Acousti-Mat SD], or approved equal.

B. Sound Reduction Board:

1. USG Corporation: 3/8" Levelrock SRB, or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for conditions affecting performance.

1. Proceed with application only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. General: Prepare and clean substrate according to manufacturer's written instructions.

1. Treat nonmoving substrate cracks according to manufacturer's written instructions to prevent cracks from telegraphing (reflecting) through underlayment.
2. Fill substrate voids to prevent underlayment from leaking.

B. Concrete Substrates: Mechanically remove, according to manufacturer's written instructions, laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants that might impair underlayment bond.

1. Moisture Testing: Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates do not exceed a maximum moisture-vapor-emission rate of 3 lb. of water/1000 sq. ft. in 24 hours, or as required to meet the manufacturer's recommendations of floor finishes to be applied.

C. Wood Substrates: Mechanically fasten loose boards and panels to eliminate substrate movement and squeaks. Sand to remove coatings that might impair underlayment bond and remove sanding dust.

1. Install underlayment reinforcement recommended in writing by manufacturer.

D. Metal Substrates: Mechanically remove, according to manufacturer's written instructions, rust, foreign matter, and other contaminants that might impair underlayment bond. Apply corrosion-resistant coating compatible with underlayment if recommended in writing by underlayment manufacturer.

E. Nonporous Substrates: For ceramic tile, quarry tile, and terrazzo substrates, remove waxes, sealants, and other contaminants that might impair underlayment bond, and prepare surfaces according to manufacturer's written instructions.

F. Adhesion Tests: After substrate preparation, test substrate for adhesion with underlayment according to manufacturer's written instructions.

G. Sound Control [Mat] [and] [Board]: Install sound control materials according to manufacturer's written instructions.

1. Do not install mechanical fasteners that penetrate through the sound control materials.

3.3 APPLICATION

A. General: Mix and apply underlayment components according to manufacturer's written instructions.

1. Close areas to traffic during underlayment application and for time period after application recommended in writing by manufacturer.
2. Coordinate application of components to provide optimum underlayment-to-substrate and intercoat adhesion.
3. At substrate expansion, isolation, and other moving joints, allow joint of same width to continue through underlayment.

B. Apply primer over prepared substrate at manufacturer's recommended spreading rate.

C. Apply underlayment to produce uniform, level surface.

1. Apply a final layer without aggregate to product surface.
2. Feather edges to match adjacent floor elevations.

D. Cure underlayment according to manufacturer's written instructions. Prevent contamination during application and curing processes.

E. Do not install floor coverings over underlayment until after time period recommended in writing by underlayment manufacturer.

F. Remove and replace underlayment areas that evidence lack of bond with substrate, including areas that emit a "hollow" sound when tapped.

3.4 PROTECTION

A. Protect underlayment from concentrated and rolling loads for remainder of construction period.

END OF SECTION 035413

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Dimensional lumber and Plywood used for miscellaneous blocking, cants, and nailers.

1.3 DEFINITIONS

A. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) or greater but less than 5 inches nominal (114 mm actual) in least dimension.

B. Lumber grading agencies, and the abbreviations used to reference them, include the following:

   1. NeLMA: Northeastern Lumber Manufacturers' Association.
   2. NLGA: National Lumber Grades Authority.
   3. RIS: Redwood Inspection Service.
   4. SPIB: The Southern Pine Inspection Bureau.
   5. WCLIB: West Coast Lumber Inspection Bureau.
   6. WWPA: Western Wood Products Association.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

   1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
   2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.

3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

B. Fastener Patterns: Full-size templates for fasteners in exposed framing.

1.5 INFORMATIONAL SUBMITTALS

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

B. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Fire-retardant-treated wood.
3. Engineered wood products.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
3. Provide dressed lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal (38-mm actual) thickness or less.

C. Engineered Wood Products: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.

1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Application: Treat all rough carpentry unless otherwise indicated.

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with

the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.

1. Use treatment that does not promote corrosion of metal fasteners.
2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
4. Design Value Adjustment Factors: Treated lumber shall be tested according ASTM D 5664 and design value adjustment factors shall be calculated according to ASTM D 6841.

C. Kiln-dry lumber after treatment to a maximum moisture content of 15 percent.

D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

E. Application: Treat all rough carpentry in fire rated locations.

2.4 ENGINEERED WOOD PRODUCTS

A. Engineered Wood Products, General: Products shall contain no urea formaldehyde. Comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Source Limitations: Obtain each type of engineered wood product from single source from a single manufacturer.

C. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Boise Cascade Corporation.
    b. Finnforest USA.
    c. Georgia-Pacific.
    d. Jager Building Systems Inc.
    e. Louisiana-Pacific Corporation.
    f. Pacific Woodtech Corporation.
    g. Roseburg Forest Products Co.

h. Standard Structures Inc.
i. Stark Truss Company, Inc.
j. West Fraser Timber Co., Ltd.
k. Weyerhaeuser Company.

2.5 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Rooftop equipment bases and support curbs.
4. Cants.
5. Grounds.

B. For concealed boards, provide lumber with 15 percent maximum moisture content and any of the following species and grades:

1. Mixed southern pine; No. 2 grade; SPIB.
2. Hem-fir or hem-fir (north); Construction or No. 2 Common grade; NLGA, WCLIB, or WWPA.
3. Spruce-pine-fir (south) or spruce-pine-fir; Construction or No. 2 Common grade; NeLMA, NLGA, WCLIB, or WWPA.
4. Eastern softwoods; No. 2 Common grade; NeLMA.
5. Northern species; No. 2 Common grade; NLGA.
6. Western woods; Construction or No. 2 Common grade; WCLIB or WWPA.

C. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

D. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.6 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: DOC PS 1, Exterior AC, in thickness indicated or, if not indicated, not less than 3/4-inch (19-mm) nominal thickness. Provide fire-retardant treated where code required.

2.7 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

E. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).

F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Grade A1 or A4).

2.8 MISCELLANEOUS MATERIALS

A. Adhesives for Gluing Furring and Sleepers to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.

1. Adhesives shall have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chloropyrifos as its active ingredient.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.

B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

C. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

D. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.

E. Shear Wall Panels: Install shear wall panels to comply with manufacturer's written instructions.

F. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

G. Install sill sealer gasket to form continuous seal between sill plates and foundation walls.

H. Do not splice structural members between supports unless otherwise indicated.

I. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches (406 mm) o.c.

J. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:

1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches (2438 mm) o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
2. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. (9.3 sq. m) and to solidly fill space below partitions.

K. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with

function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

L. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.
2. Use copper naphthenate for items not continuously protected from liquid water.

M. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.
2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.

N. Use hot dipped galvanized screw fasteners unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive fasteners snug.

O. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.

1. Comply with approved fastener patterns where applicable. Before fastening, mark fastener locations, using a template made of sheet metal, plastic, or cardboard.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

C. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

3.3 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, review with Architect. Depending on severity, material may have to be replaced with dry. With Architect's permission, some material may be able to be treated with EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

SECTION 066116- SOLID SURFACING FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

A. Provide all labor, materials, accessories, equipment and incidentals to complete solid surface polymer fabrication work as required including, but not limited to, the following:

1. Counter Tops

B. Related Work Specified Elsewhere:

1.	Rough Carpentry	Division 6
2.	Plumbing Fixtures	Division 15

1.3 SUBMITTALS

A. Product Data: Manufacturer's published product literature including product description, specifications, illustrated details, material safety data sheets, fabrication information and compliance with specified performance requirements.

B. Shop Drawings: Showing layout, elevations, dimensions, component sizes, fabrication details, attachment provisions and coordination requirements with adjacent work, required clearances.

C. Samples:

1. Countertop material, 6 inches (150 mm) square.

D. Maintenance Data: Submit manufacturer's care and maintenance data, including repair and cleaning instructions.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer who is an authorized representative of solid surface polymer product manufacturer for both installation and maintenance of work required for this project.

B. Allowable Tolerances: Variation in component size 1/8" (3 mm) +/-.

C. Comply with the Following Standards as referenced herein:

1. American National Standards Institute (ANSI)
2. American Society for Testing and Materials (ASTM)
3. National Electrical Manufacturers Association (NEMA)

D. Product shall meet the following requirements in accordance with the test procedures indicated:

1. Tensile Strength: 6000 psi/ASTM D 638

2. Flexural Strength: 8000 psi/ASTM D 790

3. Elongation: 0.4%/ASTM D 638

4. Hardness: 94 Rockwell "M" Scale, ASTM D 785,
56 Barcol Impressor/ASTM D 2583

5. Thermal Expansion: 3.02 x 10^{-5} in/in/^{o}C; 1.80 x 10^{-5} in/in/^{o}F in accordance with ASTM D 696.

6. Gloss (60^{o} Gardner) 5-75 (matte-polished)/ANSI Z124

7. Color Stability: No Change NEMA LD 3-3.10

8. Wear and Cleanability: Passes ANSI Z 124.3 & Z 124.6

9. Abrasion Resistance: No loss of pattern, Wt. loss (1,000 cycles) -0.2 gm Wear (10,000 cycles) -.008" per NEMA LD 3-3.10

10. Impact Resistance:

    a. Notched Izod: .28 ft. lbs./in. of notch per ASTM D 256 (Method A)
    b. Gardner: Solid colors 9.3 ft. lbs. particulate colors 13.3 ft. lbs. per ASTM D 3029

11. Stain Resistance: Passes ANSI Z 124.3

12. Fungi and Bacteria: No attack per ASTM G21, G22

13. Water Absorption: Per ASTM D 570

    a. 3/4" (12 mm) sheet, 0.04% after 24 hrs., 0.94% long term.
    b. 1/4" (6 mm) sheet, 0.09% after 24 hrs., 0.8% long term.

14. Flammability: 0-25 Flame Spread, 0-30 Smoke Developed Rating, Class 1 Rating per ASTM E 84

15. Coefficient of Friction: 0.189 static, 0.171 dynamic per DuPont Test TD-511-A

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver components to project site at time when areas are ready for installation. Store components indoors prior to installation.

B. Handle materials to prevent damage to finished surfaces. Provide protective coverings to prevent physical damage and/or staining following installation for duration of project.

1.6 WARRANTY

A. Provide manufacturer's 10 year warranty against defects in materials. Warranty shall provide material and labor to repair or replace defective materials. Damage caused by physical or chemical abuse or damage from excessive heat will not be warranted.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements of the specifications, provide solid surface polymer fabrications by Meganite or approved equal.

2.2 MATERIALS

A. Material: Homogeneous filled acrylic; not coated, laminated or of composite construction meeting ANSI Z 124.3 & .6, Type Six.

1. Material shall comply with the minimum physical properties listed under Quality Assurance article above.
2. Superficial damage to a depth of 0.010" (.25 mm) shall be repaired by sanding and polishing.

B. Counter Tops: Top, Front and Backsplash surfaces shall be 1/2" (12 mm) thick solid surface polymer with Square edge with apron. Fabricate tops in one piece with shop-applied edges and backsplashes unless otherwise indicated. Solid surface polymer adhesively joined to 3/4" "FRTW" plywood substrate with inconspicuous seams and edge details as indicated.. Attach to support structure with silicone sealant or other concealed fastening method recommended by the manufacturer as recommended by product manufacturer for the intended application. color selected by Architect from manufacturer's full range of colors

C. Particleboard: ANSI A208.1, Grade M-2-Exterior Glue.

D. Plywood: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.

E. Joint Adhesive: Manufacturer's standard two-part adhesive to create inconspicuous, non-porous joints, with a chemical bond.

F. Sealant: Mildew Resistant silicone, color matched to solid surface polymer , in accordance with Section 07900.

2.3 FABRICATION

A. Fabricator/Installer shall be a firm certified by product manufacturer.

B. Fabricate components in shop to greatest extent practical to sizes, shapes and profiles indicated, and in accordance with approved shop drawings and manufacturer's written requirements.

C. Form Joints between components using manufacturer's standard joint adhesive. Joints shall be inconspicuous in appearance and without voids. Attach 2" (50 mm) wide reinforcing strip of solid surface polymer under each joint in accordance with manufacturer's written requirements. Coordinate required construction clearance for reinforcing strips.

D. Countertops shall be the thickness specified; one piece wherever possible, and with flush joints sealed with joint adhesive where required. Use sheets with matching batch numbers from the manufacturer. Shop fabricate in the largest sections possible for transporting and building access.

E. Backsplash height shall be according to detail provided. Backsplash shall be field installed, with tight, sealed joints.

F. Sinks shall be as selected from manufacturer's standard sink designs as specified in the plumbing section, and shall be adhered according to manufacturer's recommendations. Cutouts for sinks furnished by others shall be smooth and uniform to be by router.

G. Rout and Finish Component Edges to a smooth, uniform finish. Rout all cut-outs, then sand all edges smooth. Repair or replace defective or inaccurate work.

H. Finish: All surfaces shall have uniform matte finish with a gloss rating of 5-20.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install components plumb and level, in accordance with approved shop drawings and product installation details.

B. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work. Keep components and hands clean when making joints.

C. Keep components and hands clean during installation. Remove adhesives, sealants and other stains.

D. Protect surfaces from damage until Date of Substantial Completion. Repair or replace damaged work that cannot be repaired to architect's satisfaction.

E. Fabricator/Installer shall provide solid surface polymer manufacturer's written care and maintenance instructions to the Owner and review care and maintenance procedures with Owner's maintenance personnel upon project completion.

END OF SECTION 066116

SECTION 078413 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Penetrations in fire-resistance-rated walls, including both empty openings and openings containing penetrating items.
2. Penetrations in horizontal assemblies.

1.3 PERFORMANCE REQUIREMENTS

A. General: For penetrations through the following types of fire-resistance-rated constructions, including both empty openings and openings containing penetrating items, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.

1. Fire-resistance-rated walls including fire walls, fire partitions, fire barriers, and smoke barriers.
2. Fire-resistance-rated horizontal assemblies including floors, floor/ceiling assemblies, and ceiling membranes of roof/ceiling assemblies.

B. Rated Systems: Provide through-penetration firestop systems with the following ratings determined per ASTM E 814 or UL 1479:

1. T-Rated Systems: For the following conditions, provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings, where systems protect penetrating items exposed to potential contact with adjacent materials in occupiable floor areas:

a. Penetrations located outside wall cavities.
b. Penetrations located outside fire-resistance-rated shaft enclosures.

C. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provides products that, after curing, do not deteriorate when exposed to these conditions both during and after construction.

1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.

2. For floor penetrations with annular spaces exceeding 4 inches (100 mm) in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved, either by installing floor plates or by other means.
3. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

D. For through-penetration firestop systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product Schedule: For each penetration firestopping system. Include location and design designation of qualified testing and inspecting agency.

1. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping condition, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Product Certificates: For through-penetration firestop system products, signed by product manufacturer.

C. Installer Certificates: From Installer indicating penetration firestopping has been installed in compliance with requirements and manufacturer's written recommendations.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for penetration firestopping.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A firm that has been approved by FM Global according to FM Global 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."

B. Installer Qualifications: A firm experienced in installing penetration firestopping similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its penetration firestopping products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.

C. Installation Responsibility: Assign installation of through-penetration firestop systems and fire-resistive joint systems in Project to a single qualified installer.

D. Source Limitations: Obtain through-penetration firestop systems, for each kind of penetration and construction condition indicated, through one source from a single manufacturer.

E. Fire-Test-Response Characteristics: Penetration firestopping shall comply with the following requirements and those specified in Part 1 “Performance Requirements” Article:

1. Penetration firestopping tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.
2. Penetration firestopping is identical to those tested per testing standard referenced in Part 1 “Performance Requirements” Article. Provide rated systems complying with the following requirements:

a. Penetration firestopping products bear classification marking of qualified testing and inspecting agency.
b. Classification markings on penetration firestopping correspond to designations listed by the following:

1) UL in its "Fire Resistance Directory."

F. Preinstallation Conference: Conduct conference at Project site.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver through-penetration firestop system products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, shelf life if applicable, qualified testing and inspecting agency's classification marking applicable to Project, curing time, and mixing instructions for multi-component materials.

B. Store and handle materials for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not install penetration firestopping when ambient or substrate temperatures are outside limits permitted by penetration firestopping manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.

B. Install and cure penetration firestopping per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.9 COORDINATION

A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping is installed according to specified requirements.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping.

C. Notify Owner's testing agency at least seven days in advance of penetration firestopping installations; confirm dates and times on day preceding each series of installations.

D. Do not cover up through-penetration firestop system installations that will become concealed behind other construction until each installation has been examined by an approved inspecting agency and building official, if required by authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following manufacturers:

1. Grace Construction Products.
2. Hilti, Inc.
3. Nelson Firestop Products.
4. Specified Technologies Inc.
5. Tremco, Inc.; Tremco Fire Protection Systems Group.

2.2 PENETRATION FIRESTOPPING

A. Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.

B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
1. F-Rating: Not less than the fire-resistance rating of constructions penetrated.

C. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).

1. Horizontal assemblies include shaftwall assemblies.
2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
3. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.

D. W-Rating: Provide penetration firestopping showing no evidence of water leakage when tested according to UL 1479.

E. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

F. VOC Content: Penetration firestopping sealants and sealant primers shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Sealants: 250 g/L.
2. Sealant Primers for Nonporous Substrates: 250 g/L.
3. Sealant Primers for Porous Substrates: 775 g/L.

G. Low-Emitting Materials: Penetration firestopping sealants and sealant primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

H. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspecting agency for firestopping indicated. Accessories include, but are not limited to the following items:

1. Permanent forming/damming/backing materials, including the following:

a. Slag-wool-fiber or rock-wool-fiber insulation.
b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
c. Fire-rated form board.
d. Fillers for sealants.

2. Temporary forming materials.
3. Substrate primers.
4. Collars.
5. Steel sleeves.

2.3 FILL MATERIALS

A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.

C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized-steel sheet.

E. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.

F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.

G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.

H. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives. Where exposed, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed.

I. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

J. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and sloped surfaces, unless indicated firestopping limits use of nonsag grade for both opening conditions.
2. Grade for Vertical Surfaces: Non-sag formulation for openings in vertical and other surfaces.

2.4 MIXING

A. For those products requiring mixing before application, comply with penetration firestopping manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning: Clean out openings immediately before installing penetration firestopping to comply with manufacturer's written instructions and with the following requirements:

1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping.
2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping. Remove loose particles remaining from cleaning operation.
3. Remove laitance and form-release agents from concrete.

B. Priming: Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent penetration firestopping from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing firestopping's seal with substrates.

3.3 INSTALLATION

A. General: Install penetration firestopping to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.

B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestopping.

C. Install fill materials for firestopping by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

A. Identify penetration firestopping with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of firestopping edge so labels will be visible to anyone seeking to remove penetrating items or firestopping. Use mechanical fasteners or self-adhering-type

labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:

1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
2. Contractor's name, address, and phone number.
3. Designation of applicable testing and inspecting agency.
4. Date of installation.
5. Manufacturer's name.
6. Installer's name.

3.5 FIELD QUALITY CONTROL

A. Owner will engage a qualified testing agency to perform tests and inspections.

B. Where deficiencies are found or penetration firestopping is damaged or removed because of testing, repair or replace penetration firestopping to comply with requirements.

C. Proceed with enclosing penetration firestopping with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping is without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping and install new materials to produce systems complying with specified requirements.

3.7 EXPLANATION OF UL SYSTEM NUMBERING METHOD

A. The format of the UL Listing Numbers for Firestop Systems Designs appearing in the UL Directory is Alpha – Alpha-Numeric, such as CAJ-1000 for example.

B. The first “Alpha” grouping uses the following characters to identify the type of penetrated fire separation:
   1. “C” for both floor and wall penetrations
   2. “F” for floor penetrations only
   3. “W” for wall penetrations only

C. The second “Alpha” grouping uses the following characters to identify the type of construction:

   1. “A” For concrete floors less than or equal to 5 inches thick (minimum)

2. "B" For concrete floors greater than 5 inches thick (minimum)
3. "C" For framed floors
4. "D" For deck construction
5. "E-I" Reserved for future use
6. "J" For concrete or masonry walls less than or equal to 8 inches thick (minimum)
7. "K" For concrete or masonry walls greater than 8 inches thick (minimum)
8. "L" For framed walls
9. "M" For bulkheads
10. "N-Z" Reserved for future use

D. The numeric grouping will use the following sequences of numbers for the penetrating items shown:

1. 0000-0999 None, No penetrating items.
2. 1000-1999 Metal pipe, conduit, or tubing.
3. 2000-2999 Non-metallic pipe, conduit, or tubing.
4. 3000-3999 Electrical cables.
5. 4000-4999 Electrical cables in a cable tray.
6. 5000-5999 Insulated pipes.
7. 6000-6999 Miscellaneous electrical penetrants such as bus ducts.
8. 6000-7000 Miscellaneous mechanical penetrants such as air ducts.
9. 8000-8999 Mixed penetrants containing any of the above.
10. 9000-9999 Reserved for future use.

3.8 PENETRATION FIRESTOPPING SCHEDULE

A. Where UL-classified systems are indicated, they refer to system numbers in UL's "Fire Resistance Directory" under product Category XHEZ.

B. Firestopping with No Penetrating Items [FS-<#>]:

1. UL-Classified Systems: [C-AJ-] [C-BJ-] [F-A-] [F-B-] [F-C-] [W-J-] [W-L-].
2. UL Numbers: 0001-0999.
3. Type of Fill Materials: One or more of the following:

a. Latex sealant.
b. Silicone sealant.
c. Intumescent putty.
d. Mortar.

C. Firestopping for Metallic Pipes, Conduit, or Tubing [FS-<#>]:

1. UL-Classified Systems: [C-AJ-] [C-BJ-] [C-BK-] [F-A-] [F-B-] [F-C-] [F-E-] [W-J-] [W-K-] [W-L-] [W-N-].
2. UL Numbers: 1001-1999.
3. Type of Fill Materials: One or more of the following:

a. Latex sealant.
b. Silicone sealant.

c. Intumescent putty.
d. Mortar.

D. Firestopping for Nonmetallic Pipe, Conduit, or Tubing [FS-<#>]:

1. UL-Classified Systems: [C-AJ-] [C-BJ-] [C-BK-] [F-A-] [F-B-] [F-C-] [F-E-] [W-J-] [W-K-] [W-L-] [W-N-].
2. UL Numbers: 2001-2999.
3. Type of Fill Materials: One or more of the following:

a. Latex sealant.
b. Silicone sealant.
c. Intumescent putty.
d. Intumescent wrap strips.
e. Firestop device.

E. Firestopping for Electrical Cables [FS-<#>]:

1. UL-Classified Systems: [C-AJ-] [C-BJ-] [C-BK-] [F-A-] [F-B-] [F-C-] [F-E-] [W-J-] [W-K-] [W-L-].
2. UL Numbers: 3001-3999.
3. Type of Fill Materials: One or more of the following:

a. Latex sealant.
b. Silicone sealant.
c. Intumescent putty.
d. Silicone foam.
e. Pillows/bags.

F. Firestopping for Cable Trays with Electric Cables [FS-<#>]:

1. UL-Classified Systems: [C-AJ-] [C-BJ-] [F-A-] [F-B-] [F-C-] [W-J-] [W-K-] [W-L-].
2. UL Numbers: 4001-4999.
3. Type of Fill Materials: One or more of the following:

a. Latex sealant.
b. Intumescent putty.
c. Silicone foam.
d. Pillows/bags.
e. Mortar.

G. Firestopping for Insulated Pipes [FS-<#>]:

1. UL-Classified Systems: [C-AJ-] [C-BJ-] [C-BK-] [F-A-] [F-B-] [F-C-] [F-E-] [W-J-] [W-L-] [W-N-].
2. UL Numbers: 5001-5999.
3. Type of Fill Materials: One or more of the following:

a. Latex sealant.
b. Intumescent putty.

c. Silicone foam.
d. Intumescent wrap strips.

H. Firestopping for Miscellaneous Electrical Penetrants [FS-<#>]:

1. UL-Classified Systems: [C-AJ-] [C-BJ-] [F-A-] [W-L-] [W-J-].
2. UL Numbers: 6001-6999.
3. Type of Fill Materials: One or more of the following:

a. Latex sealant.
b. Intumescent putty.
c. Mortar.

I. Firestopping for Miscellaneous Mechanical Penetrants [FS-<#>]:

1. UL-Classified Systems: [C-AJ-] [C-BJ-] [F-A-] [F-B-] [F-C-] [F-E-] [W-J-] [W-L-] [W-N-].
2. UL Numbers: 7001-7999.
3. Type of Fill Materials: One or both of the following:

a. Latex sealant.
b. Mortar.

J. Firestopping for Groupings of Penetrants [FS-<#>]:

1. UL-Classified Systems: [C-AJ-] [C-BJ-] [F-A-] [F-B-] [F-C-] [F-E-] [W-J-] [W-L-].
2. UL Numbers: 8001-8999.
3. Type of Fill Materials: One or more of the following:

a. Latex sealant.
b. Mortar.
c. Intumescent wrap strips.
d. Firestop device.
e. Intumescent composite sheet.

END OF SECTION 078413

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Silicone joint sealants
2. Urethane joint sealants
3. Latex joint sealants

1.3 PRECONSTRUCTION TESTING

A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.

1. Use ASTM C 1087 and manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. Submit not fewer than two pieces of each kind of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
5. Testing will not be required if joint-sealant manufacturers submit joint preparation data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:

1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
2. Conduct field tests for each application indicated below:

a. Each kind of sealant and joint substrate indicated.

3. Notify Architect seven days in advance of dates and times when test joints will be erected.
4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.

    a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

        1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

5. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.4 SUBMITTALS

A. Product Data: For each joint-sealant product indicated used inside the weatherproofing system, including printed statement of VOC content.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

D. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

E. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.

G. Preconstruction Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

H. Preconstruction Field-Adhesion Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.

I. Field-Adhesion Test Reports: For each sealant application tested.

J. Warranties: Sample of special warranties.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

C. Product Testing: Test joint sealants using a qualified testing agency.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

D. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

E. Pre-installation Conference: Conduct conference at Project site.

1.6 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.

4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.7 WARRANTY

A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
2. Disintegration of joint substrates from natural causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. VOC Content of Interior Sealants: Provide sealants and sealant primers for use inside the weatherproofing system that comply with the following limits for VOC content when calculated according to 40 CFR 59, Part 59, Subpart D (EPA Method 24):

1. Architectural Sealants: 250 g/L.
2. Sealant Primers for Nonporous Substrates: 250 g/L.
3. Sealant Primers for Porous Substrates: 775 g/L.

C. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.

D. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

E. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food; provide products that comply with 21 CFR 177.2600.

F. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 50, for Use NT. Use at vertical surfaces and non-traffic horizontal surfaces such as, but not limited to, joints of exterior and interior precast panel joints, and exterior frames of windows, doors and louvers.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. BASF Building Systems; Omniseal 50.
b. Dow Corning Corporation; 791
c. GE Advanced Materials – Silicones; SilPruf SCS2000
d. Pecora Corporation; 895.
e. Tremco Incorporated; Spectrem 2.

B. Single-Component, Nonsag, Acid-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use N. Uses: Interior sanitary applications, countertops, backsplashes, lavatories, plumbing fixtures.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Dow Corning Corporation; 999-A.
b. GE Advanced Materials – Silicones; Construction SCS1200
c. Pecora Corporation; 860.
d. Tremco Incorporated; Proglaze, Tremsil 200.

C. Single-Component, Pourable, Traffic-Grade, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade P, Class 100/50, for Use T. Self-leveling pavement joint sealant.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Dow Corning Corporation; 890-SL.
b. Pecora Corporation; 300 SL, 310 SL.
c. Tremco Incorporated; Spectrem 900 SL.

D. Mildew-Resistant, Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT. For sealing ceramic tile joints and other nonporous substrates subject to in service exposures of high humidity and extreme temperatures.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. GE Silicones; Sanitary 1700
b. Pecora Corporation; 898.
c. Tremco Inc., Tremsil 600 White

E. Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT. Uses: Joints at tile and plumbing fixtures.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. BASF Building Systems; Omniplus.
b. Dow Corning Corporation; 786 Mildew Resistant
c. GE Advanced Materials - Silicones; Sanitary SCS1700.
d. Tremco Incorporated; Tremsil 200 Sanitary.

2.3 URETHANE JOINT SEALANTS

A. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT. Use for flashing and sheet metal joints and general purpose.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. BASF Building Systems; Sonolastic NP1.
b. Pecora Corporation; Dynatrol I-XL.
c. Tremco Incorporated; Vulkem 116.

B. Single-Component, Pourable, Traffic-Grade, Urethane Joint Sealant: ASTM C 920, Type S, Grade P, Class 25, for Use T. Self-Leveling traffic sealant

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. BASF Building Systems; Sonolastic SL 1.
b. Pecora Corporation; Urexpan NR-201.
c. Tremco Incorporated; Vulkem 45.

C. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C 920, Type M, Grade NS, Class 50, for Use NT. General Purpose

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Pecora Corporation; Dynatrol II.
b. Polymeric Systems, Inc.; PSI-270.
c. Tremco Incorporated; Dymeric 240, Dymeric 240 FC.

D. Immersible, Single-Component, Nonsag, Traffic-Grade, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Uses T and I.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. BASF Building Systems; Sonolastic NP1.
b. Sika Corporation, Construction Products Division; Sikaflex - 1a.
c. Tremco Incorporated; Vulkem 116.

2.4 LATEX JOINT SEALANTS

A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF. General purpose.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. BASF Building Systems; Sonolac.
b. Pecora Corporation; AC-20+.
c. Tremco Incorporated; Tremflex 834.

2.5 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include, but are not limited to, the following:

    a. Concrete.
    b. Masonry.
    c. Unglazed surfaces of ceramic tile.
    d. Exterior insulation and finish systems.

3. Remove laitance and form-release agents from concrete.
4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include, but are not limited to, the following:

    a. Metal.
    b. Glass.
    c. Porcelain enamel.
    d. Glazed surfaces of ceramic tile.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.

3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Non-sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.

G. Installation of Preformed Silicone-Sealant System: Comply with the following requirements:

1. Apply masking tape to each side of joint, outside of area to be covered by sealant system.
2. Apply silicone sealant to each side of joint to produce a bead of size complying with preformed silicone-sealant system manufacturer's written instructions and covering a bonding area of not less than 3/8 inch (10 mm). Hold edge of sealant bead 1/4 inch (6 mm) inside masking tape.
3. Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
4. Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.

H. Acoustical Sealant Installation: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations.

3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

1. Extent of Testing: Test completed and cured sealant joints as follows:

a. Perform 10 tests for the first 1000 feet (300 m) of joint length for each kind of sealant and joint substrate.
b. Perform 1 test for each 1000 feet (300 m) of joint length thereafter or 1 test per each floor per elevation.

2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

    a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

3. Inspect tested joints and report on the following:

    a. Whether sealants filled joint cavities and are free of voids.
    b. Whether sealant dimensions and configurations comply with specified requirements.
    c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.

4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

B. Evaluation of Field-Adhesion Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 079200

SECTION 092116 - GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

A. Provide all labor, materials, accessories, equipment, incidentals to complete gypsum board assembly work, as indicated and required including, but not necessarily limited to, the following:

1. Interior Gypsum Wallboard.
2. Non-Load-Bearing Steel Framing and Furring for gypsum board assemblies.
3. Metal Grid Ceiling and Soffit Suspension System.
4. Accessories and trim.
5. Taping and Spackling.
6. Installation of access panels in gypsum board assemblies,
7. Reinforcing and blocking to receive and support the work of other trades.
8. Building in items furnished by other trades and/or contracts.

B. Related Work Specified Elsewhere:

Rough Carpentry	Division 6
Painting	Division 9

1.3 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide non-load-bearing gypsum board wall and partition assemblies capable of withstanding uniform load of 5 lbf/sq. ft. over entire wall for heights of partitions indicated without failing.

1. Deflection Limit: L/360, unless otherwise indicated; L/600 for gypsum board assemblies with ceramic tile facing.
2. Provide framing member size, thickness and spacing, and supplemental bracing as necessary to comply with manufacturer's published recommendations for conditions of installation and performance requirements.

1.4 SUBMITTALS

A. Submit manufacturer's product data and installation instructions for each type of product indicated.

B. Shop Drawings showing layout, locations, fabrication, and installation of all control and expansion joints including plans, elevations, sections, details of components and attachments of other units of work including concealed blocking.

C. Submit ceiling grid system, framed ceiling suspension system, and soffit suspension system layout drawings, to scale, showing spacing, dimensions of members, direction of main runners, edge conditions where abutting other surfaces, seismic bracing details, custom trim and ceiling opening locations including; location of diffusers, grilles, lighting fixtures, smoke detectors, sprinklers, and other items.

D. Samples: For the following products:

1. Trim Accessories: Full-size sample in 12-inch-long length for each trim accessory indicated.

1.5 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: For gypsum board assemblies with fire-resistance ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

1. Fire-Resistance-Rated Assemblies: Indicated by design designations from UL's "Fire Resistance Directory", or in Gypsum Association GA-600 "Fire Resistance Design Manual".

B. Comply w1ith the requirements of the following:

1.	ASTM C 36	"Standard Specification for Gypsum Wallboard."
2.	ASTM C 474	"Standard Test Methods for Joint Treatment Materials for Gypsum Board Construction."
3.	ASTM C 475	"Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board."
4.	ASTM C 645	"Standard Specification for Nonstructural Steel Framing Members."
5.	ASTM C 754	"Standard Specification for Installation of Steel Framing Members to Receive Screw Attached Gypsum Panel Products."
6.	ASTM C 840	"Standard Specification for Application and Finishing of Gypsum Board."
7.	ASTM C 919	"Standard Specification for Use of Sealants in Acoustical Applications."
8.	ASTM C 954	"Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 inches (0.84 mm) to 0.112 in. (2.84 mm) in thickness."

9.	ASTM C 1002	"Standard Specification for Specification for Steel Drill Screws for the Application of Gypsum Panel or Metal Plaster Bases."
10.	ASTM C 1047	"Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base."
11.	GA-216	"Recommend Specifications for the Application and Finishing of Gypsum Board."

C. Sound Rated Assemblies: Provide materials and construction identical to assemblies indicated and in accordance with ASTM E 90 and classified according to ASTM E 413 by a qualified independent testing agency to achieve the STC Rating indicated, or if not indicated, a minimum STC Rating of 50.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original unopened containers, packages or bundles bearing brand name and identification of manufacturer or supplier.

B. Use or develop a written plan for the management of the jobsite for the delivery, storage, installation and protection of the products until completion of the project.

C. Store materials inside under cover and in manner to keep them dry, protected from direct exposure to rain, snow, condensation, direct sunlight, surface contamination, corrosion, damage, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

D. Handle gypsum boards to prevent damage to edges, ends or surfaces. Protect metal corner beads and trim from being bent or damaged.

1.7 PROJECT CONDITIONS

A. Comply with ASTM C 840 and ASTM C 843 (veneer plaster) requirements gypsum board manufacturer's written recommendations, whichever are more stringent, for environmental conditions before, during and after application of gypsum board and plaster skim coat construction work.

B. Environmental Limitations: Room temperatures shall be maintained at not less than 50 degrees F, during application of gypsum board for a minimum period of 48 hours prior to, during and following application of gypsum board, joint treatment materials and bonding of adhesives.

C. Further maintain not more than 80 degrees F (27 deg C) for 7 days prior to application of gypsum base and plaster skim coat, continuously during application, and after application until plaster skim coat is dry.

D. Avoid exposure to excessive, repetitive or continuous moisture, before, during, and after installation. Eliminate sources of moisture immediately.

E. Ventilation: Adequate ventilation shall be maintained in the work area of building spaces as required to remove water in excess of that required for drying of joint treatment material and plaster skim coat during installation and curing period. Avoid drafts during dry, hot weather to prevent too rapid drying.

F. Do not install interior gypsum panels until installation areas are enclosed and conditioned.

G. Do not install panels that are wet, moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

H. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide products of one of the following; or approved equal:

1. Metal Support Materials:

a. Dale/Incor, Inc.
b. National Gypsum Co.
c. Dietrich Industries, Inc.
d. Unimast, Inc.

2. Gypsum Board and Related Products:

a. Georgia-Pacific Corp.
b. Gold Bond Building Products Div., National Gypsum Co.
c. United States Gypsum Co.

3. Deflection Track and Clips:

a. The Steel Network, Inc.
b. approved equal

2.2 STEEL PARTITION AND SOFFIT FRAMING SYSTEMS

A. Framing Members, General:

1. Comply with ASTM C 754 for conditions indicated.

2. Steel Sheet Components: Complying with ASTM C 645 requirements for metal and with ASTM A 653, G40, hot-dip galvanized zinc coating.

B. Metal Studs: ASTM C645; 0.0329 (20 gauge) min. thickness of base metal or heavier if required by referenced standards to support indicated loads within maximum deflections specified. Hot dipped galvanized per ASTM A 653, G 40, G60 at toilet rooms and shower areas. Depth 3-5/8 inches unless otherwise indicated.

C. Studs and Runners: ASTM C 645. Use either steel studs and runners or dimpled steel studs and runners.

1. Dimpled Steel Studs and Runners:

a. Minimum Base-Metal Thickness: 0.025 inch (0.64 mm) unless otherwise indicated.
b. Depth: 3-5/8 inches (92 mm) unless otherwise indicated.

D. Slip-Type Head Joints: Where indicated, provide one of the following:

1. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.

a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1) Dietrich Metal Framing; SLP-TRK Slotted Deflection Track.
2) MBA Building Supplies; FlatSteel Deflection Track or Slotted Deflecto Track.
3) Steel Network Inc. (The); VertiClip SLD or VertiTrack VTD Series.
4) Superior Metal Trim; Superior Flex Track System (SFT).
5) Telling Industries; Vertical Slip Track or Vertical Slip Track II.

E. Firestop Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Fire Trak Corp.; Fire Trak System attached to studs with Fire Trak Posi Klip.
b. Grace Construction Products; FlameSafe FlowTrak System.
c. Metal-Lite, Inc.; The System.
d. Steel Network Inc. (The); VertiClip SLD or VertiTrack VTD Series.

F. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.

1. Minimum Base-Metal Thickness: 0.033 inch (0.84 mm).

G. Cold-Rolled Channel Bridging: Steel, 0.053-inch (1.34-mm) minimum base-metal thickness, with minimum 1/2-inch- (13-mm-) wide flanges.

1. Depth: 1-1/2 inches (38 mm) unless otherwise indicated.
2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches (38 by 38 mm), 0.068-inch- (1.72-mm-) thick, galvanized steel.

H. Hat-Shaped, Rigid Furring Channels: ASTM C 645.

1. Minimum Base-Metal Thickness: 0.033 inch (0.84 mm) unless otherwise indicated.
2. Depth: 7/8 inches (38 mm) unless otherwise indicated.

I. Resilient Furring Channels: 1/2-inch- (13-mm-) deep, steel sheet members designed to reduce sound transmission.

1. Configuration: Asymmetrical or hat shaped unless otherwise indicated.

J. Cold-Rolled Furring Channels: 0.053-inch (1.34-mm) uncoated-steel thickness, with minimum 1/2-inch- (13-mm-) wide flanges.

1. Depth: 3/4 inch (19 mm) unless otherwise indicated.
2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum uncoated-steel thickness of 0.033 inch (0.8 mm).
3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch- (1.59-mm-) diameter wire, or double strand of 0.048-inch- (1.21-mm-) diameter wire.

K. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches (32 mm), wall attachment flange of 7/8 inch (22 mm), minimum uncoated-metal thickness of 0.018 inch (0.45 mm), and depth required to fit insulation thickness indicated.

2.3 INTERIOR GYPSUM WALLBOARD

A. Panel Size: Provide panels in maximum lengths and widths available that will minimize joints in each area and correspond with the support system indicated.

B. Gypsum Wallboard: ASTM C-36; tapered edges, Type X for fire resistance rated assemblies.

1. Smooth Regular Faced Gypsum Wallboard: 5/8” thick, unless otherwise indicated, with long ends tapered. Use Type X where required for fire resistance rated assemblies.
2. Interior Gypsum Ceiling Board: 5/8” thick, unless otherwise indicated, manufactured with a special gypsum core containing additives to offer greater support and sag resistance for water based spray texture paints and insulation than 5/8” standard regular-type panels. Use Type X where required for fire resistance rated assemblies.

2.4 TRIM ACCESSORIES

A. Interior Trim:

1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc, except as otherwise indicated, ASTM C 1047
2. Shapes:

    a. Expansion (control) joint.
    b. Curved-Edge Cornerbead: With notched or flexible flanges.

B. Self-Masking Trim: PVC edge moldings with removable protective strip.

1. Use at exposed panel edges where gypsum board abuts other materials.
2. Manufacturers: Subject to compliance with requirements, provide products one of the following:

    a. Fast Mask S-100; Flannery Inc.
    b. Peel Away Angle; A-Z Bogart Inc.
    c. Ceiling Trim No. 22 Vinyl Tech; Plastic Components Inc.

2.5 JOINT TREATMENT MATERIALS

A. Joint Treatment Materials: Comply with ASTM C 475 and recommendations of manufacturer.

B. Joint tape:

1. Use perforated paper type for interior wallboard unless otherwise recommended by the panel manufacturer.

C. Joint compound: Comply with ASTM C 475 and recommendations of the manufacturer.

1. For interior gypsum wallboard use setting-type taping compound followed by coats of setting-type sandable topping compound or as otherwise recommended by manufacturer.

D. Concealed Acoustical Sealant: Non-drying, non-hardening, non-skinning, non-staining, non-bleeding, gunnable synthetic rubber sealant recommended for sealing interior concealed applications per ASTM C 919.

2.6 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.

1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

1. Use adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. Plaster Bonder: For bonding new plaster to any structurally sound interior surface of the type recommended by the drywall/veneer plaster manufacturer.

D. Spot Grout: ASTM C 475, setting-type joint compound recommended for spot grouting steel door frames, transoms, side lites and borrowed lites.

E. Fastening Adhesive for Metal: Special adhesive recommended for laminating gypsum panels to steel framing.

F. Steel Drill Screws: ASTM C 1002.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.

G. Framing screws: ASTM C 646 - Corrosion Resistant.

H. Power actuated fasteners: Type recommended by manufacturer for securing runners and furring strips to masonry and concrete.

I. Steel drill screws: ASTM C 954 - Corrosion Resistant for fastening panels to steel members.

J. Isolation Strip at Exterior Walls: Provide one of the following:

1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch (3.2 mm) thick, in width to suit steel stud size.
3. Sound Attenuation Blankets: Use thermal batt insulation sized for full depth of stud thickness, as specified in Division 07 Section “Thermal Insulation”

K. Acoustical Sealant for Exposed and Concealed Joints: Nonsag, paintable, nonstaining, latex sealant complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Pecora Corp.; AC-20 FTR Acoustical and Insulation Sealant.
b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.

L. Acoustical Sealant for Concealed Joints: Nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Ohio Sealants, Inc.; Pro-Series SC-170 Rubber Base Sound Sealant.
b. Pecora Corp.; AIS-919.
c. Tremco, Inc.; Tremco Acoustical Sealant.

M. Sound Attenuation Blankets: ASTM C 665, Type I (provide full depth batt insulation blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

PART 3 - EXECUTION

3.1 INSPECTION

A. Installer must examine the areas and conditions under which gypsum board assembly work is to be installed and notify the General Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754.

1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, wire shelving, or similar construction. Comply with details indicated and with gypsum board manufacturer's written recommendations or, if none available, with United States Gypsum's "Gypsum Construction Handbook.

C. Isolate steel framing from building structure at locations indicated to prevent transfer of loading imposed by structural movement.

1. Isolate ceiling assemblies where they abut or are penetrated by building structure.
2. Isolate partition framing and wall furring where it abuts structure, except at floor. Install slip-type joints at head of assemblies that avoid axial loading of assembly and laterally support assembly.

a. Use proprietary deflection track except as otherwise indicated.

D. Install bracing at terminations in assemblies.

E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

F. Firestop Tracks: Install to maintain continuity of fire-resistance-rated assembly indicated.

G. Sound-Rated Shaft Wall Assemblies: Seal with acoustical sealant at perimeter of each assembly and at joints and penetrations.

H. Remove and replace panels that are wet, moisture damaged, or mold damaged.

3.3 INSTALLING FRAMED ASSEMBLIES

A. Install framing system components according to spacing indicated, but not greater than spacing required by referenced installation standards for assembly types.

1. Single-Layer Application: 16 inches (406 mm) o.c. unless otherwise indicated.
2. Multilayer Application: 16 inches (406 mm) o.c. unless otherwise indicated.

B. Where studs are installed directly against dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

C. Install studs so flanges within framing system point in same direction.

D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.

1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.

    a. Install two studs at each jamb unless otherwise indicated.
    b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (13-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
    c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.

3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.

4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.

    a. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.

5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

E. Furring Members:

1. Erect insulation, specified in Division 07 Section "Thermal Insulation" vertically and hold in place with Z-furring members spaced 24 inches (610 mm) o.c.
2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.
3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches (305 mm) from corner and cut insulation to fit.

F. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

3.4 WALLBOARD INSTALLATION

A. Installation of gypsum board products shall be in accordance with ASTM C 840 “Standard Specification for Application and Finishing of Gypsum Board”, and GA-216.

B. Inspect all surfaces and framing to which gypsum wallboard is to be applied. Remedy all conditions that will jeopardize satisfactory finish walls prior to installation of drywall. Check alignment and plumb of all framing and furring.

C. Install thermal blankets to full thickness of stud depth in lieu of acoustical batts as indicated, and in accordance with insulation manufacturer’s recommendations for installation and attachment, prior to gypsum panels unless readily installed after panels have been installed on one side.

D. Install appropriate gypsum panel perpendicular to the framing and up against the floor and metal deck. Use the correct type and length of fastener, including spacing to meet the intended fire resistance rating. Install panels on both sides of the metal framing unless otherwise indicated.

E. Install gypsum soffit and ceiling boards across framing to minimize the number of abutting end joints and avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

F. Install single layer wallboard assemblies horizontally with Type "S" Bugle head drywall screws spaced not more than 12" o.c. Stagger joints on both sides of two sided partitions. Tightly install thermal batt insulation as indicated between studs. Butt boards together for a light contact at edges and ends with not more than 1/16" open space between boards. Do not force into place.

G. Position boards so that like edges abut, tapered edges against tapered edges and mill-cut field-cut ends against mill-cut or field-cut ends. Do not place tapered edges against cut edges or ends.

Stagger vertical joints over different studs on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

H. Install gypsum board with face side out. Do not install imperfect, damaged, or damp panels. Butt panels together for a light contact at edges and ends with not more than 1/16-inch open space between panels. Do not force into place.

I. Form control joints and expansion joints with space between edges of boards, prepared to receive trim accessories. Spacing of control and expansion joints shall be as shown and/or in accordance with the gypsum board manufacturer's written recommendations.

J. Isolate perimeter of non-load-bearing gypsum board partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch-wide spaces at these locations, and trim edges with L-bead edge trim where edges of gypsum panels are exposed.

K. Install in maximum practical lengths to span wall and ceiling framing without end (butt) joints. If butt joints do occur, stagger joints and locate as far as possible from center of walls and ceilings.

L. Sound-Insulated Assemblies: Seal construction at perimeters, behind control and expansion joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through gypsum board assemblies, including sealing partitions above acoustical ceilings.

1. Penetrations in assemblies include, but are not limited to, ducts, pipes, conduits, electrical boxes, outlets and switches.

M. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's written recommendations.

1. Space screws a maximum of 12 inches o.c. for vertical applications.

N. Cut openings in gypsum board to fit items to be built in, including electrical outlets, accessories, etc. Openings shall fit snugly and shall be small enough to be covered by plates and escutcheons. Both face and back paper shall be cut for all cutouts that are not made by use of a saw. Support gypsum board securely around all cutouts and openings.

O. Allow the other trades to install the needed services (MEP) through the gypsum board.

P. Install all required through stop penetrations. Continue installing the remaining gypsum panels to complete the wall in accordance with the fire rated design.

Q. Install fasteners not more than 1" and no closer than 3/8" to end or edges. Space fasteners opposite each other on adjacent ends or edges. Begin fastening from center of wallboard and proceed toward outer end of edges. Apply pressure on wallboard adjacent to fasteners being driven to ensure that wallboard will be secured tightly to framing members. Check for looseness at fastener. Drive fasteners with shank reasonably perpendicular to face of board. Drive screws

with a power screwdriver of type recommended by the wallboard manufacturer. Surface of head shall be below surface of paper without cutting paper. Apply acoustic sealant at all penetrations for electric receptacles, switches, wire, piping, ductwork and other applicable sources of sound transmission.

R. Pack voids in steel door and lite frames and the like, etc. with sound attenuation.

3.5 PANEL APPLICATION METHODS

A. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.
2. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.

    a. Stagger abutting end joints not less than one framing member in alternate courses of board.
    b. At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.

B. Multilayer Application on Ceilings: Apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints 1 framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.

C. Multilayer Application on Partitions/Walls: Apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.

D. Single-Layer Fastening Methods: Apply gypsum panels to supports with steel drill screws.

E. Multilayer Fastening Methods: Fasten base layers with screws; fasten face layers with adhesive and supplementary fasteners.

1. Where required for fire-resistance ratings, fasten base layers and face layers separately to supports with screws.

F. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.

3.6 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints at locations indicated on Drawings and according to ASTM C 840, in specific locations approved by Architect for visual effect. If not indicated, provide control joints at maximum spacing of 20'-0" in all directions, at changes in panel height, and at one side of all door frames.

3.7 FINISHING GYPSUM BOARD ASSEMBLIES

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints, rounded or beveled edges, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below, according to ASTM C 840, for locations indicated.

1. Level 1: Embed tape at joints in ceiling plenum areas, concealed areas, and where indicated.
2. Level 4: Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges at panel surfaces that will be exposed to view, unless otherwise indicated.

3.8 ACCESSORY INSTALLATION

A. General: Where feasible, use the same fasteners to anchor trim accessory flanges as required to fasten gypsum board to the supports. Otherwise, fasten flanges by nailing or stapling in accordance with manufacturer's instructions and recommendations.

B. Install metal corner beads at external corners of drywall work.

C. Install metal edge trim whenever edge of gypsum board would otherwise be exposed or semi-exposed, and except where plastic trim is indicated. Provide type with face flange to receive joint compound except where semi-finishing type is indicated. Install L-type trim where work is tightly abutted to other work, and install special kerf-type where other work kerfed to receive long leg of L-type trim. Install U-type trim where edge is exposed, revealed, gasketed, or sealant-filled (including expansion joints).

D. Install J-type semi-finishing trim where gypsum board edges are not covered by applied moldings.

E. Omit fastening wallboard closer than one support away from area where casing trim will be installed. Insert metal flange between wallboard and bearing surface, and move in until properly aligned. Fasten wallboard through metal flange before bedding perforated tape.

F. Maintain metal edge in a true line.

3.9 JOINT TREATMENT

A. Apply bedding compound to edge and end joints and to fastener heads. Use types as recommended by gypsum manufacturer for use with gypsum product being installed. Shear off surplus leaving a tapered groove for embedding tape. Leave no material on high edge. Allow 12 hours for drying before taping.

B. Apply a uniformly thin layer of bedding compound over the joint approximately 4" wide. Center tape over joints and embed into compound.

C. Allow compound to dry thoroughly for approximately 24 hours. Cover tape with a coat of compound and spread out 3" on each side of tape. Feather out at edges.

D. After preceding coat is thoroughly dry, apply another coat with slight uniform crown over joints. This coat must be smooth and with edges feathered out 3" beyond preceding coat.

E. All fastener heads and dimples shall receive at least three (3) coats of compound. Apply as each coat is applied to joints, allowing at least 24 hours between each coat.

F. Cover flanges of beads and trim with at lease two (2) coats of compound. First layer shall be bedding compound. Apply along with respective coats of compound on joints. Feather out compound approximately 9" from metal bead.

G. Sand coats of compounds when thoroughly dry and sanding is needed. Avoid roughing surface of gypsum board product.

H. Leave wallboard uniformly smooth and ready for decoration.

3.10 PROTECTION OF WORK

A. Provide temporary protection to installed panels, such as tarps, as required. The intent is to protect the gypsum panels in those areas where, when installed, exhibit increased potential for impingement by water in its liquid state. Protect from cascading water.

B. Provide final protection and maintain conditions, in a manner suitable to installer, which ensures gypsum board assembly work being without damage or deterioration at time of substantial completion.

END OF SECTION 092116

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Interior gypsum board.
2. Tile backing panels.

B. Related Requirements:

1.	Rough Carpentry	Division 6
2.	Joint Sealants	Division 7
3.	Painting	Division 9
4.	Ceramic Tiling	Division 9

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For the following products:

1. Trim Accessories: Full-size Sample in 12-inch long length for each trim accessory indicated.

C. Samples for Initial Selection: For each type of trim accessory indicated.

D. Samples for Verification: For the following products:

1. Trim Accessories: Full-size Sample in 12-inch-long length for each trim accessory indicated.

1.4 QUALITY ASSURANCE

A. Mockups: Build mockups of at least 50 sq. ft. in surface area to demonstrate aesthetic effects and to set quality standards for materials and execution.

1. Build mockups for the following:

a. Each level of gypsum board finish indicated for use in exposed locations.

2. Apply or install final decoration indicated, including painting and wallcoverings, on exposed surfaces for review of mockups.
3. Simulate finished lighting conditions for review of mockups.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

A. Gypsum Wallboard: ASTM C 1396/C 1396M.
   1. Georgia-Pacific Corp.
   2. Gold Bond Building Products Div., National Gypsum Co.
   3. United States Gypsum Co.
   4. Thickness: 5/8 inch
   5. Long Edges: Tapered .

B. Gypsum Board, Type X: ASTM C 1396/C 1396M.
   1. Georgia-Pacific Corp.
   2. Gold Bond Building Products Div., National Gypsum Co.
   3. United States Gypsum Co.
   4. Thickness: 5/8 inch
   5. Long Edges: Tapered.

C. Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.
   1. Georgia-Pacific Corp.
   2. Gold Bond Building Products Div., National Gypsum Co.
   3. United States Gypsum Co.
   4. Core: 5/8 inch, Type X.
   5. Long Edges: Tapered.
   6. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.4 TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A118.9 and ASTM C 1288 or ASTM C 1325, with manufacturer's standard edges.
   1. Georgia-Pacific Corp.
   2. Gold Bond Building Products Div., National Gypsum Co.
   3. American Gypsum
   4. Thickness: 1/4 inch
   5. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.5 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc
2. Shapes:

    a. Cornerbead.
    b. Bullnose bead.
    c. LC-Bead: J-shaped; exposed long flange receives joint compound.
    d. L-Bead: L-shaped; exposed long flange receives joint compound.
    e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
    f. Expansion (control) joint.
    g. Curved-Edge Cornerbead: With notched or flexible flanges.

2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.
2. Exterior Gypsum Soffit Board: Paper.
3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
4. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints beveled panel edges**,** and damaged surface areas, use setting-type taping compound.

2. Fill Coat: For second coat, use setting-type, sandable topping compound.
3. Finish Coat: For third coat, use setting-type, sandable topping compound.
4. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound
5.

D. Joint Compound for Tile Backing Panels:

1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.
2. Cementitious Backer Units: As recommended by backer unit manufacturer.
3. Water-Resistant Gypsum Backing Board: Use setting-type taping compound and setting-type, sandable topping compound.

2.7 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

a. Pecora Corp.; AC-20 FTR Acoustical and Insulation Sealant.
b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members or provide control joints to counteract wood shrinkage.

3.3 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:

1. Wallboard Type: As indicated on Drawings

B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.

    a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
    b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.

3. On Z-shaped furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 APPLYING TILE BACKING PANELS

A. Glass-Mat, Water-Resistant Backing Panels: Comply with manufacturer's written installation instructions and install at showers, tubs, and where indicated. Install with 1/4-inch gap where panels abut other construction or penetrations.

B. Cementitious Backer Units: ANSI A108.11, at showers, tubs, and where indicated.

C. Water-Resistant Backing Board: Install where indicated with 1/4-inch gap where panels abut other construction or penetrations.

D. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.5 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Interior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners unless otherwise indicated.

3.6 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joint beveled edges, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 5: Where indicated on Drawings.

a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

E. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.

F. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.7 APPLYING TEXTURE FINISHES

A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.

B. Texture Finish Application: Mix and apply finish using powered spray equipment, to produce a uniform texture matching approved mockup and free of starved spots or other evidence of thin application or of application patterns.

C. Prevent texture finishes from coming into contact with surfaces not indicated to receive texture finish by covering them with masking agents, polyethylene film, or other means. If, despite

these precautions, texture finishes contact these surfaces, immediately remove droppings and overspray to prevent damage according to texture-finish manufacturer's written instructions.

3.8 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 093013 - CERAMIC TILING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Porcelain tile.
2. Stone thresholds.
3. Waterproof membrane
4. Crack isolation membrane.
5. Metal edge strips.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. RELATED WORK SPECIFIED ELSEWHERE

1. Gypsum Board Assemblies Division 9

C. Samples:

1. Each type and composition of tile and for each color and finish required.
2. Full-size units of each type of trim and accessory for each color and finish required.
3. Stone thresholds in 6-inch length

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Tile and Trim Units: Furnish quantity of full-size units equal to 2 percent of amount installed for each type, composition, color, pattern, and size indicated.
2. Grout: Furnish quantity of grout equal to 2 percent of amount installed for each type, composition, and color indicated

1.5 QUALITY ASSURANCE

A. Source Limitations for Tile: Obtain tile of each type and color or finish from one source or producer.

1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.

B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from one manufacturer and each aggregate from one source or producer.

C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer for each product:

1. Stone thresholds.
2. Waterproof membrane.
3. Crack isolation membrane.
4. Joint sealants.
5. Cementitious backer units.
6. Metal edge strips.

D. Preinstallation Conference: Conduct conference at Project site.

1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

1.1 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.

B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.

C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.

D. Store liquid materials in unopened containers and protected from freezing.

E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.2 PROJECT CONDITIONS

A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 PRODUCTS, GENERAL

A. ANSI Ceramic Tile Standard: Provide Standard-grade tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.

1. Provide tile complying with Standard grade requirements unless otherwise indicated.

B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

C. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

D. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.

1. Where tile is indicated for installation in swimming pools or in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.

E. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with continuous film of petroleum paraffin wax, applied hot. Do not coat unexposed tile surfaces.

2.2 TILE PRODUCTS

A. Ceramic Tile Type (**CT-#)**: Colors and Patterns: Subject to compliance with requirements, provide product contained in the interior finish schedule documents.

1. Tile Color and Pattern: As indicated by manufacturer's designations.
2. Grout Color: As contained in the finish schedule documents.

3. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:
   a. Base Cove: Cove, module size to match face tile size.
   b. Base Cap for Thin-Set Mortar Installations: Surface bullnose, module size To match face tile size.
   c. External Corners for Thin-Set Mortar Installations: Surface bullnose, module size to match face tile size.
   d. Internal Corners: Field-butted square corners. For coved base and cap, use angle pieces designed to fit with stretcher shapes.
   e. Tapered Transition Tile: Shape designed to effect transition between thickness of tile floor and adjoining floor finishes of different thickness, tapered to provide reduction in thickness from 1/2 to 1/4 inch across nominal 4-inch dimension.

2.3 THRESHOLDS

A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.

   1. Double Hollywood edge threshold. Limit height of threshold to 1/4 inch or less above adjacent floor surface. Build up adjacent surfaces as needed to achieve the ¼" or less.

B. Marble Thresholds: ASTM C 503, with a minimum abrasion resistance of 12 per ASTM C 1353 or ASTM C 241 and with honed finish.

   1. Description: Bucak Dark Walnut Pol Curb, width determined by door frame.

2.1 TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A118.9 or ASTM C 1325, in maximum lengths available to minimize end-to-end butt joints.

   1. Products: Subject to compliance with requirements, provide one of the following:

      a. C-Cure; C-Cure Board 990.
      b. Custom Building Products; Wonderboard.
      c. FinPan, Inc.; Util-A-Crete Concrete Backer Board.
      d. USG Corporation; DUROCK Cement Board.

   2. Thickness: 1/2 inch.

2.2 WATERPROOF MEMBRANE

A. General: Manufacturer's standard product that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

B. Polyethylene Sheet: Polyethylene faced on both sides with fleece webbing; 0.008-inch nominal thickness.

1. Products: Subject to compliance with requirements, provide the following:

a. Schluter Systems L.P.; KERDI.

2.3 CRACK ISOLATION MEMBRANE

A. General: Manufacturer's standard product that complies with ANSI A118.12 for standard performance and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

B. Polyethylene Sheet: Polyethylene faced on both sides with fleece webbing; 0.008-inch nominal thickness.

1. Products: Subject to compliance with requirements, provide the following:

a. Schluter Systems L.P.; KERDI.

C. Corrugated Polyethylene: Corrugated polyethylene with dovetail-shaped corrugations and with anchoring webbing on the underside; 3/16-inch nominal thickness.

1. Products: Subject to compliance with requirements, provide the following:

a. Schluter Systems L.P.; DITRA.

2.4 SETTING MATERIALS

A. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Boiardi Products; a QEP company.
b. Bonsal American; an Oldcastle company.
c. Bostik, Inc.
d. Jamo Inc.
e. Laticrete International, Inc.
f. MAPEI Corporation.

g. Southern Grouts & Mortars, Inc.
h. Summitville Tiles, Inc.
i. TEC; a subsidiary of H. B. Fuller Company.

2. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
3. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.4.

2.5 GROUT MATERIALS

A. Polymer-Modified Tile Grout: ANSI A118.7.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Boiardi Products; a QEP company.
b. Bonsal American; an Oldcastle company.
c. Bostik, Inc.
d. Jamo Inc.
e. Laticrete International, Inc.
f. MAPEI Corporation.
g. Southern Grouts & Mortars, Inc.
h. Summitville Tiles, Inc.
i. TEC; a subsidiary of H. B. Fuller Company.

2. Polymer Type: Ethylene vinyl acetate or acrylic additive, in dry, redispersible form, prepackaged with other dry ingredients.

B. Grout for Pregrouted Tile Sheets: Same product used in factory to pregrout tile sheets.

2.6 ELASTOMERIC SEALANTS

A. General: Provide sealants, primers, backer rods, and other sealant accessories that comply with the following requirements and with the applicable requirements in Section 079200 "Joint Sealants."

1. Sealants shall have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. Use primers, backer rods, and sealant accessories recommended by sealant manufacturer.

B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints unless otherwise indicated.

C. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with

fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.

1. Products: Subject to compliance with requirements, provide one of the following:

    a. DAP Inc.; 100 percent Silicone Kitchen and Bath Sealant.
    b. Dow Corning Corporation; Dow Corning 786.
    c. GE Silicones; a division of GE Specialty Materials; Sanitary 1700.
    d. Laticrete International, Inc.; Latasil Tile & Stone Sealant.
    e. Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
    f. Tremco Incorporated; Tremsil 600 White.

2.7 MISCELLANEOUS MATERIALS

A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

B. Temporary Protective Coating: Either product indicated below that is formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.

1. Petroleum paraffin wax, fully refined and odorless, containing at least 0.5 percent oil with a melting point of 120 to 140 deg F per ASTM D 87.
2. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.

C. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

D. Grout Sealer: Manufacturer's standard product for sealing grout joints and that does not change color or appearance of grout.

1. Products: Subject to compliance with requirements, provide one of the following:

    a. Bonsal American; an Oldcastle company; Grout Sealer.
    b. Jamo Inc.; Penetrating Sealer.
    c. MAPEI Corporation; KER 004, Keraseal Penetrating Sealer for Unglazed Grout and Tile.
    d. Southern Grouts & Mortars, Inc.; Silicone Grout Sealer.
    e. Summitville Tiles, Inc.; SL-15, Invisible Seal Penetrating Grout and Tile Sealer.
    f. TEC; a subsidiary of H. B. Fuller Company; TA-256 Penetrating Silicone Grout Sealer.

2.8 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

B. Add materials, water, and additives in accurate proportions.

C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.

1. Verify that substrates for setting tile are firm, dry, clean, free of coatings that are incompatible with tile-setting materials including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
2. Verify that concrete substrates for tile floors installed with thin-set mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.

    a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
    b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.

3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thinset mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.

B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot (1:50) toward drains.

C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

D. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 CERAMIC TILE INSTALLATION

A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.

For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:

a. Tile floors in wet areas.
b. Tile floors consisting of tiles 8 by 8 inches or larger.
c. Tile floors consisting of rib-backed tiles.

B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.

E. Where accent tile differs in thickness from field tile, vary setting bed thickness so that tiles are flush.

F. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.

G. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:

1. Porcelain Tile: 1/16 inch

H. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.

I. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.

J. Stone Thresholds: Install stone thresholds in same type of setting bed as adjacent floor unless otherwise indicated.

1. Do not extend cleavage membrane, waterproofing, or crack isolation membrane under thresholds set in latex-portland cement mortar. Fill joints between such thresholds and adjoining tile set on cleavage membrane, waterproofing, or crack isolation membrane with elastomeric sealant.

K. Metal Edge Strips: Install where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of tile and no threshold is indicated.

L. Grout Sealer: Apply grout sealer to cementitious grout joints in tile floors according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

3.1 TILE BACKING PANEL INSTALLATION

A. Install cementitious backer units and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated. Use latex-portland cement mortar for bonding material unless otherwise directed in manufacturer's written instructions.

3.2 WATERPROOFING INSTALLATION

A. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness and bonded securely to substrate.

B. Do not install tile or setting materials over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

3.3 CRACK ISOLATION MEMBRANE INSTALLATION

A. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness and bonded securely to substrate.

B. Do not install tile or setting materials over crack isolation membrane until membrane has cured.

3.4 CLEANING AND PROTECTING

A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

1. Remove latex-portland cement grout residue from tile as soon as possible.
2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
3. Remove temporary protective coating by method recommended by coating manufacturer and that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent drain clogging.

B. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.

C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.

D. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

END OF SECTION 093000

SECTION 096513 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Resilient base.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified, not less than 12 inches long.

PART 2 - PRODUCTS

2.1 THERMOSET-RUBBER BASE – RB-## as indicated on the drawings.

A. Product Standard: ASTM F 1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous).

1. Style and Location:
   a. Style A, Cove: Provide in areas with resilient flooring as indicated on the drawings.

B. Thickness: as indicated on the drawings by product type.

C. Height: As indicated on Drawings.

D. Lengths: 8 feet long or coils in manufacturer's standard length.

E. Outside Corners: Job formed.

F. Inside Corners: Job formed.

G. Colors: As selected by Architect from full range of industry colors.

2.2 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

C. Floor Polish: Provide protective, liquid floor-polish products recommended by resilient stair-tread manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates for Resilient Stair Accessories: Prepare horizontal surfaces according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing.
4. Moisture Testing: Proceed with installation only after substrates pass testing according to manufacturer's written recommendations, but not less stringent than the following:

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install resilient products until they are the same temperature as the space where they are to be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.2 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

G. Job-Formed Corners:

1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.

    a. Form without producing discoloration (whitening) at bends.

2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.

    a. Miter or cope corners to minimize open joints.

3.3 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.

B. Floor Polish: Remove soil, visible adhesive, and surface blemishes from resilient stair treads before applying liquid floor polish.

1. Apply two coat(s).

C. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 096513

SECTION 096519 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Solid vinyl floor tile.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Product Data: For adhesives, indicating VOC content.
2. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.
3. Laboratory Test Reports: For flooring products, indicating compliance with requirements for low-emitting materials.

C. Shop Drawings: For each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.

1. Show details of special patterns.

D. Samples: Full-size units of each color and pattern of floor tile required.

E. Product Schedule: Luxury Vinyl Tile (LVT-1)

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Floor Tile: Furnish one box for every **50** boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer with a minimum of 5 years commercial resilient flooring installation experience, and who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.

1. Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store floor tiles on flat surfaces.

1.9 FIELD CONDITIONS

A. HVAC system should be operational and running for a minimum of 7 days prior to resilient tile installation and remain running after resilient tile installation.

B. Maintain ambient temperatures within range recommended by manufacturer, but not less than 65 deg F or more than 85 deg F, in spaces to receive floor tile during the following time periods:

1. 48 hours before installation.
2. During installation.
3. Permanently after installation.

C. Close spaces to traffic during floor tile installation.

D. Close spaces to traffic, all heavy rolling loads, and point loads for 48 to 72 hours after floor tile installation.

E. Install floor tile after other finishing operations, including painting, have been completed.

1.10 WARRANTY

A. Special Warranty for Resilient Tile; Manufacturer agrees to repair or replace defective material within specified warranty period.

1. Warranty does not include installer's workmanship.
2. Resilient tile must be installed and maintained according to manufacturer's recommendations.
3. Warranty Period:
   a. Manufacturing Defects Warranty: **10** years.
   b. Limited Commercial Wear Warranty: **10** years.
   c. Underbed Warranty: 10 years.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

B. Flooring products shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.2 SOLID VINYL FLOOR TILE

A. Basis-of-Design Product: Subject to compliance with requirements, provide Shaw Contract Group; **Terrain 20 mil** or comparable product by one of the following:

B. AVA - DSGN

C. Tile Standard: ASTM F 1700.

1. Class: Class III, printed film vinyl tile.
2. Type: [**A, smooth surface**] [**B, embossed surface**].

D. Overall Thickness: **0.098 inch (2.5 mm)**

E. Wear Layer Thickness: **0.020 inch (0.5 mm)**

F. Size: **6 by 48 inches (152 by 1219 mm)**

G. Colors and Patterns: **As selected by Architect from full range of manufacturer's designations**.

H. Test Data:

1. Slip Resistance: ASTM D 2047 >0.65
2. Residual Indentation, ASTM F 1914 passes <8%
3. Flexibility, ASTM F 137: Passes.
4. Static Load: ASTM F 970. 1500 PSI
5. Resistance to Heat, ASTM F 1514: Passes.
6. Resistance to Light, ASTM F 1515: Passes.
7. Resistance to Chemicals, ASTM 925: Passes.
8. Radiant Flux, ASTM E 648: greater than 0.45 watts/cm, NFPA Class I.
9. Smoke Density, ASTM E 662: less than 450, Passes.

2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.

1. Adhesives shall have a VOC content of 50 g/L or less.
2. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

C. Floor Polish: Provide protective, neutral pH liquid floor-polish products recommended by floor tile manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than **10** pH.
4. Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:
    a. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates are below 90 percent relative humidity level.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install floor tiles until they are the same temperature as the space where they are to be installed.

1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

A. Comply with manufacturer's written instructions for installing floor tile.

B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.

1. Lay tiles **square with room axis**.

C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.

1. Lay tiles **with grain running in one direction**.

D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.

G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

H. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.

B. Perform the following operations immediately after completing floor tile installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Optional Floor Polish: Remove soil, adhesive, and blemishes from floor tile surfaces before applying liquid floor polish.

E. Cover floor tile until Substantial Completion.

END OF SECTION 096519

SECTION 096519 RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Luxury vinyl floor tile.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for Verification: Full-size units of each color and pattern of floor tile required.

C. Product Schedule: For floor tile. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.

1. Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store floor tiles on flat surfaces.

1.9 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive floor tile during the following time periods:

1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

C. Close spaces to traffic during floor tile installation.

D. Close spaces to traffic for 48 hours after floor tile installation.

E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 SOLID VINYL FLOOR TILE (LVT-#)

A. Products: Subject to compliance with requirements, provide product indicated on Drawings.

B. Tile Standard: ASTM F 1700.
   1. Class: AS indicated by product designations.
   2. Type: A, Smooth surface.

C. Thickness: As indicated on Drawings.

D. Size: As indicated on Drawings.

E. Colors and Patterns: As indicated by manufacturer's designations.

2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.

   1. Adhesives shall comply with the following limits for VOC content:

      a. Vinyl Composition Tile Adhesives: 50 g/L or less.

C. Floor Polish: Provide protective, liquid floor-polish products if recommended by floor tile manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

   1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
4. Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:

    a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
    b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install floor tiles until they are the same temperature as the space where they are to be installed.

1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

A. Comply with manufacturer's written instructions for installing floor tile.

B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.

1. Lay tiles square with room axis, unless otherwise indicated on Drawings.

C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.

1. Lay tiles with grain running in one direction, unless otherwise indicated on Drawings.

D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.

G. Adhere floor tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.

B. Perform the following operations immediately after completing floor tile installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Floor Polish: Remove soil, adhesive, and blemishes from floor tile surfaces before applying liquid floor polish.

1. Apply one coat(s).

E. Retain "Joint Sealant" and "Sealers and Finish Coats" paragraphs below for resilient terrazzo floor tile.

F. Cover floor tile until Substantial Completion.

END OF SECTION 096519

SECTION 099000 – PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

A. Provide all plant, labor, materials, accessories, equipment and incidentals required to complete Painting and Coating work, including but not necessarily limited to, the following:

1. Surface preparation, priming and finish painting and coating of surfaces, except as otherwise specified.
2. Multiple colors, patterns, borders, fields and designs as indicated and/or selected by the Architect.
3. Finish painting and coating primed surfaces, except as otherwise indicated.
4. Exposed to view structural steel, joists, decking, lintels, covered and bare pipes and ducts (including color coding), hangers and the like along with primed metal surfaces of mechanical and electrical equipment, unless otherwise indicated, are to be painted and are included in the work of this section.
5. Do not paint prefinished items, conceal surfaces, finished metal surfaces, operating parts and labels.
6. Where touch-up painting and coating work is required, re-finish the entire surface plane.
7. All other surfaces, not specifically noted, that require painting or coatings.

B. Paint or coat exposed surfaces, except where the finish schedule indicates that a surface or material is not to be painted, coated or is to remain natural. If the schedules do not specifically mention an item or a surface, paint or coat the item or surface the same as similar adjacent materials or surfaces whether or not schedules indicate colors. If the schedules do not indicate color or finish, the Architect will select from standard colors and finishes available.

1. Painting and coating work includes field finishing of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.

C. Following categories of work are not included as part of field applied finish work or are included in other sections of these specifications.

1. Shop Priming: Shop priming of ferrous metals items is included under various sections covering structural steel, miscellaneous metal, hollow metal work and similar items.

2. Factory finished materials and equipment, including aluminum doors and frames, aluminum windows, skylights, architectural woodwork to extent shop finished, prefinished wood doors, and similar items.
3. Painting, coating and identification systems for mechanical and electrical work is specified in Plumbing, HVAC and Electrical Contracts Divisions, except as otherwise indicated.
4. Unless otherwise indicated, painting and coatings are not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, furred areas, pipe spaces, duct shafts, lift shafts.
5. Do not paint moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts, unless otherwise indicated.

1.3 REFERENCES

A. SSPC (The Society for Protective Coating) – Steel Structures Painting Manual.

B. EPA (Environmental Protection Agency) Method 24.

C. UL (Underwriters' Laboratories).

D. ASTM E 84 – Test method for Surface Burning Characteristics of Building Materials.

E. OTC (Ozone Transport Commission).

F. Applicable state requirement for VOC (Volatile Organic Compounds).

1.4 DEFINITIONS

A. Sheen: Specular gloss readings in accordance with ASTM D523.

1. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, a matte flat finish.
2. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, a high-side sheen flat, velvet-like finish.
3. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, an eggshell finish.
4. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, a satin-like finish.
5. Gloss Level 5: 35 to 70 units at 60 degrees, a semi-gloss finish.
6. Gloss Level 6: 70 to 85 units at 60 degrees, a gloss finish.

1.5 SUBMITTALS

A. Product Data: Submit manufacturer's descriptive product data for each paint and coating product finish system specified. Include block fillers and primers. Product data shall include the product name and number, product descriptive performance data, (generic classification or binder type), manufacturer's stock number and date of manufacture, contents by volume for pigment and vehicle constituents, thinning, mixing, application and curing instructions, color name and number, and VOC content and . Submit certification on manufacturer's letterhead certifying all paint and coating products being provided are in compliance with VOC requirements as required by all applicable local and state regulatory agencies with initial submittal and again at time of application. Submit manufacturer's printed application instructions and methods, including mixing, surface preparation, compatible primers and topcoats, recommended wet and dry film thickness.

B. Prior to delivery of materials to the site, the Painting subcontractor shall submit for approval, the names and products of the manufacturer to be used. This list shall be on the manufacturer's letterhead and as detailed as the list specified below in Painting and Coating Schedule. The list shall include the specific brands of paints, coatings and finishes that will be provided for each differing surface, plus a statement that the products are suitable for the purposes intended and that they comply with the Specifications. This list shall identify where each product will be used within the project, and on what surface. Submission of manufacturer's materials list and certification of compliance shall receive Architect's approval and/or comment prior to ordering materials.

C. Colors and Samples: Colors shall be selected by the Architect. The Architect will furnish the Painting subcontractor a schedule of colors and locations of various colors.

1. Selected color may or may not be ready mixed colors. Painting subcontractor shall furnish all colors, whether ready mixed, intermixed or special. The Architect will not be restricted in number of colors selected.
2. Submit for Architect's preliminary approval two 6" x 8" stepped brush out samples defining each separate coat. First coat shall be 50% than specified finish coat color. Each succeeding coat shall be 50% lighter than specified finish coat color. Include block fillers and primers of each standard and intermix color selected in a step down fashion on a leneta display card by the approved painting and coating manufacturer and each color shall have manufacturer's identification designation thereon. Provide brush out samples on actual wood surfaces of the appropriate species for transparent finished woods.
3. Identify each sample with color name and number; and product name and number.
4. Label each coat of each Sample.
5. Label each Sample for location and application area.
6. Final acceptance of colors will be from samples applied on the job.

1.6 CLOSEOUT SUBMITTALS

A. Coating Maintenance Manual: Provide coating maintenance manual including area summary with finish schedule, area detail designating location where each product/color/finish was used, product data pages, material safety data sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.7 QUALITY ASSURANCE

A. Applicator Qualifications: Engage an experienced applicator who has complete painting and coating system applications similar in material and extent to that indicated for this Project with a record of successful in service performance. Applicator for textured systems shall be one who is approved by the textured system manufacturer for proper application of the system.

B. Source limitations: Obtain block fillers, primers, and undercoat materials for each coating system from the same manufacturer as the finish coats.

C. Material application shall be applied under adequate illumination, evenly spread and smoothly applied, free of runs, sags, holidays, lap marks, air bubbles, and pin holes to assure a smooth finish.

D. Mock-Ups: Where directed provide a field sample 10 feet long by 10 feet wide (or ceiling height), completed door frame unit, as applicable, in each paint system specified. Modify as directed until accepted.

1.8 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to the job site in original unbroken sealed containers with manufacturer’s labels intact and in strict accordance with manufacturer's written recommendations. Each container shall be inspected and approved prior to being opened for use. Maintain containers in clean condition, free of foreign materials and residue.

B. Packaging shall bear the manufacturer’s label with the following information:

1. Product name and type (description).
2. Batch date.
3. Color number.
4. VOC content.
5. Environmental handling requirements.
6. Surface preparation requirements.
7. Application instructions.

C. Take every precaution against fire. Store materials in tightly covered containers, in a well ventilated locked area with ambient temperatures continuously maintained at not less than 45 deg. F and in accordance with manufacturer’s written requirements. Keep rags, waste, debris, and materials which may constitute fire hazard in water-filled closed, tightly covered, properly labeled, metal containers for daily removal. If tarpaulins are used, they shall be kept neat and no smoking shall be permitted within the space. Provide and maintain proper Class C hand fire extinguishers in the immediate area and all personnel shall be instructed in their use and informed of their location.

D. Take every precaution against the hazards of fume inhalation. Keep all areas well ventilated at all times. Where natural ventilation is insufficient to provide suitable conditions, provide special fans. If necessary, provide suitable face masks for mechanics.

1.9 PROJECT CONDITIONS

A. Apply paints and coatings only when temperature of surfaces to be painted or coated and surrounding air temperatures is above 50 and below 90 deg F, unless otherwise permitted by and in accordance with manufacturer's printed instructions.

B. Do not apply paint and coatings in snow, rain, fog, mist, or when relative humidity exceeds 70 percent and the surface temperature is at least 5 deg, F above the dew point. Prevent wide variation of temperature that might result in condensation on freshly coated surfaces.

C. Provide adequate continuous ventilation and sufficient heating facilities to maintain temperatures above 50 deg. F for 24 hours before, during and 48 hours after application of finishes.

D. Painting and coating work may be continued during inclement weather if areas and surfaces to be finished are enclosed and heated within temperature and ambient limits specified by the manufacturer during application and drying periods.

E. Take moisture readings of surfaces to be finished on a daily basis with a reliable electronic moisture meter and record moisture readings. Moisture content shall not vary more than the amount allowed by the paint manufacturer’s written requirements and recommendations.

1.10 EXTRA MATERIALS

A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.

1. Quantity: Furnish an additional (2) one gallon cans of each color and finish.
2. Label each container with color, type, gloss and room locations in addition to manufacturer’s clear and unobstructed label.

PART 2 - PRODUCTS

2.1 MANUFACTURER'S QUALITY

A. Materials shall be the highest quality grade (first line architectural), products of their respective kinds. Primers, stains and finish(es) of each coating system shall be of the same manufacturer.

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include the following.

1. Benjamin Moore (Basis of Design).
2. Sherwin Williams.
3. M.A.B.
4. PPG.
5. Or approved equal.

C. Source Limitations: Coatings for each system shall be the product of the same manufacturer to ensure compatibility of systems. Substitutions of equivalent products of other manufacturers may be submitted for approval providing the products submitted are of the same types, have label analyses similar to those specified, meet or exceed the performance criteria, and are suitable for the use intended as approved by the Architect.

D. Use thinning materials only as specified by manufacturer's labeled directions for each type of paint and coating. All coatings shall conform to all Federal, State and Local Regulations including VOC rules and air quality standards in effect at the Project location at the time of application.

2.2 MATERIALS GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint, coating, finishing system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint, coating and finishing system, provide products recommended in writing by manufacturers of topcoat for use in paint, coating and finishing system and on substrate indicated.

B. VOC Content of Field-Applied Exterior paints: Provide materials that comply with VOC limits of authorities having jurisdiction.

C. VOC Content of Field-Applied Interior paints, primers, stains, and transparent finish coatings: Provide products that comply with the following limits for VOC content, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24); these requirements do not apply to paints, primers, stains, and transparent finish coatings that are applied in a fabrication or finishing shop:

1. Primers and Undercoaters: VOC content of not more than 100 g/L.
2. Flat Paints, Coatings: VOC content of not more than 50 g/L.
3. Non-flat Paints, Coatings: VOC content of not more than 50 g/L.
4. Anti-Corrosive and Anti-Rust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
5. Clear Wood Finishes, Varnishes: VOC not more than 275 g/L.
6. Clear Wood Finishes, Lacquers: VOC not more than 275 g/L.

7. Floor Coatings: VOC not more than 50 g/L.
8. Waterproofing Sealers: VOC not more than 250 g/L
9. Sanding Sealers: VOC not more than 275 g/L
10. All Other Sealers: VOC not more than 200 g/L
11. Shellacs, Clear: VOC not more than 730 g/L.
12. Shellacs, Pigmented: VOC not more than 550 g/L.
13. Stains: VOC not more than 100 g/L.
14. Dry Fog Coatings: 400 g/L.
15. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
16. Pretreatment Wash Primers: 420 g/L.

D. Colors: As indicated, or if not indicated, as selected by the Architect from manufacturers full range.

2.3 PAINTING AND COATING SCHEDULE

A. The following is a general guide for the finish painting required, but does not include every surface or material to be finished or painted. Paint schedule is based on each Manufacturer's first line quality products. Substitution products shall be accompanied by manufacturer's literature establishing evidence of the same; and interior products shall also be in compliance with VOC limits and shall not contain restricted Chemical Components described above.

B. Each of various undercoats of paint other than natural finishes to be a slightly different shade from the preceding coat stepping up to color selected in order to verify number of coats applied.

2.4 INTERIOR PAINT AND COATING SCHEDULE

A. Interior Ferrous Metal: Provide the following finish systems over ferrous metal: For use at higher abuse areas such as metal doors and frame, trim, etc.

1. Semigloss, Latex Finish: Two finish coats over a primer.

a. Primer: Quick-drying, rust-inhibitive, metal primer, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer.

1) Moore: IronClad Latex Low Lustre Metal & Wood Enamel, (#363) VOC 380 g/L.
2) SW: Pro Industrial Pro-Cryl Universal Primer, B66-310 Series, at 5.0 to 10.0 mils wet, 2.0 to 4.0 mils dry.
3) PPG: Pitt-Tech DTM Industrial Enamel, Acrylic Primer 90-712, VOC 123 g/L.
4) Or approved equal.

b. Finish Coats: Semi-Gloss, latex, applied at spreading rate recommended by the manufacturer.

1) Moore:Eco Spec Interior Latex Semi-Gloss Enamel, (#224), VOC 11 g/L.
2) SW: Pro Industrial Pre-Catalyzed Water Based Epoxy, K46-151 Series, at 4.0 mils wet, 1.5 mils dry, per coat.
3) MAB: EnviroPure Latex Semi-Gloss, (047 line), VOC 0g/L.
4) PPG: Pure Performance Semi-Gloss Latex, 9-500 Series, VOC 0 g/L.
5) Or approved equal.

B. Interior Non-Ferrous Metal, New Galvanized and Aluminum:

1. Semigloss, Latex Finish: Two finish coats over a primer.

a. Primer: As recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer.

1) Moore: IronClad Latex Low Lustre Metal & Wood Enamel, (#363) VOC 380 g/L.
2) S-W: Pro Industrial Pro Cryl Universal Acrylic Primer, B66-310.
3) PPG: Pitt-Tech DTM Industrial Enamel, Acrylic Primer 90-712, VOC 123 g/L.
4) Or approved equal.

b. Finish Coats: Semi-Gloss, latex, at spreading rate recommended by the manufacturer.

1) Moore: Eco Spec Interior Latex Semi-Gloss Enamel, (#224), VOC 11 g/L.
2) S-W: Promar 200 Zero VOC Interior Latex Semi-Gloss, B31-2600.
3) PPG: Pure Performance Semi-Gloss Latex, 9-500 Series, VOC 0 g/L.
4) Or approved equal.

C. Interior Plaster and Drywall: General Use Unless specifically noted otherwise, Eggshell Finish/Latex:

1. Eggshell, Latex Finish: Two finish coats over a primer.

a. Prime Coat: 1 coat New wall surfaces:

1) Moore: EcoSpec Interior Latex, Primer Sealer (231), VOC 0 g/L.
2) SW: ProMar 200 Zero VOC Latex Primer, B28W2600, at 4.0 mils wet, 1.5 mils dry.
3) MAB: EnviroPure Latex Primer, (037-195), VOC 12 g/L.
4) PPG: Pure Performance, Interior Latex Primer, Series 9-900, VOC 0 g/L.
5) Or approved equal.

b. First and Second Coats: Eggshell, applied at spreading rate recommended by the manufacturer

1) Moore: EcoSpec Interior Latex Eggshell Enamel (223), VOC 1 g/L.

2) SW: ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series, at 4.0 mils wet, 1.7 mils dry, per coat.
3) MAB: EnviroPure Latex Eggshell Enamel, (045 line), VOC 10 g/L.
4) PPG: Pure Performance, Interior Eggshell Latex, 9-300 Series, VOC 0 g/L.
5) Or approved equal.

2.5 MISCELLANEOUS

A. Miscellaneous Items:

1. Provide multiple colors, patterns, borders, fields and designs as indicated, or if not indicated, as selected by the Architect.
2. Items not specifically detailed or mentioned in specifications but necessary to be painted for proper completion of job, shall be painted in accordance with instructions from Architect.

PART 3 - EXECUTION

3.1 INSPECTION

A. Applicator shall examine areas and conditions under which painting work is applied and take moisture readings with a reliable electronic moisture meter in sufficient area in each space and as often as necessary to determine the proper moisture content for application and notify Contractor in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Applicator and in accordance with paint manufacturer's written requirements for surface preparation. Starting of painting work will be construed as Applicator's acceptance of such faces and conditions within any particular area.

B. Substrate Conditions:

1. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

   a. Concrete: 12 percent.
   b. Masonry (Clay and CMU): 12 percent.
   c. Wood: 15 percent.
   d. Gypsum Board: 12 percent.
   e. Plaster: 12 percent.

2. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
3. Plaster Substrates: Verify that plaster is fully cured.
4. Spray-Textured Ceiling Substrates: Verify that surfaces are dry.

C. Proceed with coating application only after unsatisfactory conditions have been corrected; application of coating indicates acceptance of surfaces and conditions

3.2 SURFACE PREPARATION

A. General: Perform preparation and cleaning procedures in accordance with paint manufacturer's written instructions and recommendations and as herein specified, for each particular substrate condition.

B. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Contractor shall prepare all surfaces, walls, ceilings, metal frames, etc., which are to be painted, including but not limited to, scraping, sanding, spackling, patching etc. as necessary to remove loose particles, paint, mildew, greasy residue, splatters, burrs, graffiti, surface decals, surface applied texture materials, mastic, glue, etc. Repoint and/or spackle holes, voids, defects, etc. to form a smooth level surface. Remove nails, screws, anchors and the like. Sand existing metal frames, etc. to smooth out edges of various paint layers.

1. Remove incompatible primers and re-prime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Clean surfaces to be painted before applying paint or surface treatments. Remove dirt, oil and grease using an oil and grease emulsifier such as Moore’s M83, or approved equal in accordance with SSPC-SPI Method B2 prior to mechanical cleaning. Program cleaning and painting so that contaminants from cleaning process will not fall onto wet, newly painted surfaces.

E. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

1. Concrete Floors: Remove oil, dust, grease, dirt, and other foreign materials. Comply with SSPC-SP-13/NACE 6 or ICRI 03732.

F. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer's written instructions.

G. Ferrous Metals: Clean ferrous surfaces, which are not galvanized or shop-coated of oil, grease, dirt loose mill scale and other foreign substances by solvent or mechanical cleaning (SSPC – SP-1).

H. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:

1. SSPC-SP 2, "Hand Tool Cleaning."
2. SSPC-SP 3, "Power Tool Cleaning."
3. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
4. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."

I. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

J. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

K. Aluminum Substrates: Remove loose surface oxidation.

L. Plastic Trim Fabrication Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

M. Wood Substrates:

1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
2. Sand surfaces that will be exposed to view, and dust off.
3. Prime edges, ends, faces, undersides, and backsides of wood.
4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 MATERIALS PREPARATION

A. Mix and prepare painting materials in accordance with manufacturer's directions.

B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing and application of paint in a clean condition, free of foreign materials and residue.

C. Stir materials before application to produce a mixture of uniform density, and stir as required during application. Do not stir surface film into material. Remove film and if necessary, strain material before using.

3.4 APPLICATION

A. General: Apply paint in accordance with manufacturer's written instructions and recommendations. Use applicators and techniques best suited for substrate and type of material being applied. Apply according to recommended dry film thickness and recommended square foot per gallon.

B. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

C. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers. Do not proceed without written confirmation from the topcoat manufacturer sent to Architect. Bare areas are to be spot primed

D. Apply materials under adequate illumination, evenly spread and smoothly applied, free of runs, sags, holidays, lap marks, air bubbles, and pin holes to assure a smooth finish.

E. Apply additional coats when undercoat, stains or other conditions show through final paint coat, until paint film is of uniform finish, color and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces. Deep color base primers are to be used under deep finish colors to achieve proper color appearance.

F. Paint surfaces behind moveable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only before final installation of equipment.

G. Paint back sides of access panels, and removable or hinged covers to match exposed surfaces.

H. Sand lightly all abrasions and damaged spots, between each succeeding enamel, varnish coat, textured paint coat, and degloss previous painted surfaces if necessary. Spot prime water soluble stains. Re-prime prior to applying finish coats as required.

I. Scheduling Painting: Apply first-coat material to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

J. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss of adhesion of the under coat.

K. Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate, to establish a total dry film thickness as indicated or, if not indicated, as recommended by coating manufacturer.

L. Prime Coats: Apply prime coat of material which is required to be painted or finished, and which has not been prime coated by others. Prime coats shall be of the same manufacturer as the top coat.

M. Recoat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.

N. Pigmented (Opaque) Finished: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfections will not be acceptable. Cut in sharp lines and color breaks.

O. Provide satin finish or semi-gloss for final coats as indicated in the painting schedule, unless otherwise indicated.

P. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed in occupied spaces:

   a. Equipment, including panelboards.
   b. Uninsulated metal piping.
   c. Uninsulated plastic piping.
   d. Pipe hangers and supports.
   e. Metal conduit.
   f. Plastic conduit.
   g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
   h. Other items as directed by Architect.

2. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

Q. Guarantee: Manufacturer shall warrant material to conform to specification and be free of manufacturing defects for a period of one year. Applicator will guarantee that its installation of materials conforms to manufacturer's recommendations shall further guarantee its workmanship connected with the installation for a period of one year from the date of installation.

R. Completed Work: Match approved samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

S. Touch-up work: Touch-up work shall be the responsibility of the Painting Subcontractor.

3.5 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: Engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness, confirming that paint has been installed to meet paint manufacturer’s requirements.

1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.6 CLEAN-UP AND PROTECTION

A. Clean-up: During progress of work, remove from site discarded paint materials, rubbish, cans and rags at end of each work day.

B. Upon completion of painting work, clean window glass, plumbing fixtures, etc., and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

C. Protection: Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting as acceptable to Architect.

D. Provide ***'Wet Paint'*** signs as required to protect newly painted finishes. Remove temporary protective wrappings provided for protection of their work, after completion of painting operations.

E. At completion of work of other trades, Painting Subcontractor shall touch-up and restore all damaged or defaced painted surfaces.

END OF SECTION 099000

SECTION 114520 - RESIDENTIAL APPLIANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

A. Provide all labor, material, accessories, equipment and incidentals required to install residential appliances including, but not limited to, the following:

1. Drop-In Ranges
2. Full size Refrigerators
3. Microwave Ovens
4. Washer & Dryers

B. Related Work Specified Elsewhere:

Casework	Division 12
Rough Plumbing: water & gas service piping, shut-off valves, fittings, traps, plugs, stops, tail pieces, waste lines, vents, and other rough plumbing items and connections unless noted otherwise.	Division 15
Mechanical Equipment: including hood ductwork, blowers, installations and connections unless noted otherwise.	Division 15
Electrical: Installation and connections to service wire, equipment, fixtures, switch devices, and the like, unless noted otherwise.	Division 16

1.3 SUBMITTALS

A. Product Data: Submit manufacturer’s published cataloged product literature, mechanical and electrical requirements, and installation instructions for each appliance type required under this specification section for coordination with installation of casework and utilities.

B. Product Data for Owner provided equipment: Owner shall be responsible to provide product literature for each appliance type required for coordination with installation of casework and utilities.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who is an authorized representative of the residential appliance manufacturer for both installation and maintenance of appliances required for this Project.

B. Electrical components associated with appliances: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

C. Regulatory Requirements:

1. UL and NEMA Compliance: Provide electrical components required as part of residential appliances that are listed and labeled by UL and that comply with applicable NEMA standards.

2. AGA and ANSI Standards: Provide gas-burning appliances that carry the design certification seal of AGA and that comply with ANSI Z21-Series standards.

3. Insert other applicable AHAM standards required for Project.

4. Energy Ratings: Provide residential appliances that carry labels indicating energy-cost analysis (estimated annual operating costs) and efficiency information as required by the Federal Trade Commission FTC Appliance Labeling Rule.

5. Provide appliances that qualify for the EPA/DOE ENERGY STAR product labeling program.

6. Accessibility: All appliances shall comply with ANSI A117.1 and Americans with Disabilities Act (ADA) Accessibilities Guidelines for Buildings and Facilities (ADAAG).

1.5 DELIVERY

A. Deliver appliances only after utility rough-in is complete and construction in the spaces to receive appliances is substantially complete and ready for installation.

1.6 WARRANTIES

A. Provide Owner with manufacturer’s warranty for the appliances indicated, agreeing to repair or replace all defective material and equipment for a minimum of three years from date of substantial completion of the entire project.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

A. Available Products: Subject to compliance with requirements, appliances that may be incorporated into the Work are to be supplied by owner, or are existing to be reused. Verify sizes and power and ventilation requirements prior to installation:

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine roughing-in for plumbing, mechanical, and electrical services, with Installer present, to verify actual locations of services before residential appliance installation. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Comply with manufacturer's written instructions.

B. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and rough openings are completely concealed.

C. Utilities: Refer to Divisions 15 and 16 for plumbing and electrical requirements.

3.3 ADJUSTING AND CLEANING

A. Test each item to verify proper operation. Make necessary adjustments.

B. Remove packing material from appliances and leave units in clean condition, ready for operation.

END OF SECTION 114520

SECTION 123200 -ARCHITECTURAL CASEWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

A. Provide all plant, labor, materials, accessories, equipment, and incidentals to complete fabrication and installation of structural modular casework, countertops, and related necessary items as shown and specified herein. Casework shall be a structural, pre-engineered modular system and catalogued to rigid-matrix sizing allowing for future interchange of components, or entire units.

B. Related Work Specified Elsewhere:

1. Division 06 Section “Rough Carpentry”
2. Division 07 Section “Joint Sealants”
3. Division 09 Section “Resilient Base”
4. Division 09 Section “Painting”
5. Section 123661 "Simulated Stone Countertops" for countertops attached to Architectural Plam Casework.
6. Division 22 Sections covering Sinks, faucets, fittings, traps, stops, tail pieces, vacuum breakers, waste lines, vents and other plumbing items (unless otherwise noted)
7. Division 23 Sections covering Ducting, mechanical runs, Hydronic Piping, Fin Tube Radiation, Diffusers etc.
8. Division 26 Sections covering Electrical Items

1.3 QUALITY ASSURANCE

A. Manufacturers requesting approval shall submit evidence of at least 5 years experience and installations for similar type of project. Manufacturers shall also show evidence of financial stability, adequate plant facilities and schedule capacity. Full-sized samples, catalogs and specifications shall be submitted with written request for approval. Samples may be impounded by Owner and retained until completion of job for verification and compliance of specifications.

B. Quality Standard: As applicable, structural pre-engineered modular casework and installation to comply with AWI’s “Architectural Woodwork Quality Standards” Sections 1600 and 1700.

C. Accessible casework shall be in conformance with: IBC International Building Code 2009, J Edition, NJ Barrier Free Sub code, and ICC/ANSI A117.1, and the Americans with Disabilities Act.

D. Architect/Owners opinion and decision shall be final in the evaluation of manufacturers' products for approval.

E. After proposals are received, the Architect will request sample cabinets be delivered to the Owner for final selection. Include with sample casework, catalogued product data, specifications and details. Sample of casework selected will be retained until actual cabinets are delivered to job to verify compliance, after which casework contractor will remove same from project.

1.4 SUBMITTALS

A. Product Data: Submit manufacturers catalogued product data for each product indicated.

B. Shop Drawings: Submit engineered shop drawings complying with AWI's "Architectural Woodwork Quality Standards" Sections 1600 and 1700 and showing location and layout of each item, dimensioned plans and elevations, large scale details, cross sections, fillers, joints, attachment devices, cabinet-cut details, sink locations, coordination with plumbing, heating, and electrical work provided under other Contracts, and other components:

1. Indicate all related adjacent work of surrounding walls, doors, windows, heating units and diffusers, piping, electrical work and other building components.
2. Indicate requirements for furring, wall blocking, grounds and additional support work required pertinent to modular casework installation and any other Specification Sections to adequately support the work.
3. Indicate all required field measurements.
4. Coordinate production drawings with other work involved.

C. Submit samples of decorative laminate colors, patterns and textures for exposed and semi-exposed materials and edges for Architect's selection from full color palette from WilsonArt, Formica or Pionite. Submit one unit of each type of hardware or other materials and finishes for Architect's selection.

D. Submit samples for semi-exposed and concealed interiors: Light color beige, gray or white.

E. Environmental Submittals:

1. General:

a. Composite wood manufacturer's product data for each composite wood product used indicating that the bonding agent contains no added urea formaldehyde.
b. Adhesive manufacturer's product data for each adhesive used indicating that the adhesive contains no urea formaldehyde.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Protect casework during transit, delivery, storage and handling to prevent damage, soiling and deterioration.

B. Do not deliver casework until painting, wet work, grinding, and similar operations that could damage, soil or deteriorate casework have been completed in installation areas. If, due to unforeseen circumstances, casework must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas and per casework manufacturer's written recommendations.

1.6 JOB CONDITIONS

A. Conditioning: Installer shall advise Contractor of temperature and humidity requirements for modular casework installation areas as designed and for the intended use. Do not install modular casework until required temperature and relative humidity have been stabilized and will be maintained in installation areas.

B. Maintain temperature and humidity in installation area as required to maintain moisture content of installed modular casework within a 1.0% tolerance of optimum moisture content, from date of installation through remainder of construction period. The fabricator of modular casework shall determine optimum moisture content and required temperature and humidity conditions.

C. Installer shall verify clearances of all paths at job site leading to final installation site and break down the final modular casework into component assemblies sized accordingly to negotiate all corners, turns, etc., in the path to its final installation location.

1.7 GUARANTY/WARRANTY

A. Submit Manufacturer's lifetime Guaranty and warranty against defective material and workmanship. Warranty shall cover replacement and/or repair of defective material and workmanship at no cost to the Owner.

PART 2 - PRODUCTS

2.1 MANUFACUTERS

A. Subject to compliance with requirements, manufacturers offering products engineered to meet or exceed minimum performance and quality standards set by these specifications and in conformance with AWI's "Architectural Woodwork Quality Standards" Section 1600, ANSI A 161.1 and NEMA LD3 requirements may be incorporated in the work include the following:

IOPC Modular Millwork, Inc. (Basis of Design)

2.2 BASIC MATERIAL AND FABRICATION METHODS

A. General: Except as otherwise indicated, comply with following requirements for structural modular casework with reveal overlay door and drawer fronts and fully modular components (dimensionally-integrated) to allow Owner interchanging of doors, drawers, and interior components.

B. Definitions commonly used in defining decorative laminate clad casework parts by surface visibility:

1. Open Interiors: Any open storage unit without solid door or drawer fronts and units with full glass doors.
2. Closed Interiors: Any closed storage unit behind solid door or drawer fronts, glass insert doors, sliding solid doors, and/or acrylic doors.
3. Exposed Ends: Any storage unit exterior side surface that is visible after installation.
4. Other Exposed Surfaces: Faces of doors and drawers when closed, tops of cabinets less than 72” above finished floor.
5. Semi-Exposed Surfaces: Interior surfaces which are visible, bottoms of wall cabinets and tops of cabinets 72” or more above finished floor.
6. Concealed Surfaces: Any surface not normally visible after installation.

C. Particleboard: ¾” thickness, dual sided laminate wood cores of 100% recycled, industrial grade (45-60 psi hardness) with no added UF (ultra low/zero UF emitting) or exceeding ANSI A 208.1, M-3 requirements.

D. Hardboard: 1/4” thick prefinished hardboard meeting or exceeding commercial standards CS-251.

E. Laminated Plastics/Finishes: High pressure plastic laminate for exterior cabinet surfaces shall meet NEMA LD3 Exterior Glue and GP28 (.028) standards and shall be balanced with CL20 (.020”) high pressure cabinet liner or equal for closed interiors.

F. Plastic Laminate Components for Open Interiors: High pressure plastic laminate for interior cabinet surfaces shall meet NEMA LD3 and GP28 (.028) standards and unexposed exteriors shall be balanced with CL20 (.020”) high pressure cabinet liner.

G. Plastic Laminate Components for Closed Interiors: Thermally fused melamine laminate tested to meet NEMA LD 3 standards.

H. Counter Top High Pressure Plastic Laminate: High pressure plastic laminate, satin or textured finish meeting NEMA LD3 and GP50 (.050”) thickness as detailed. Heavy gauge neutral colored backing sheet for balanced construction.

I. Counter Top Solid Surface: See Section 123661 "Simulated Stone Countertops" for requirements.

J. Door/Drawer Edging: 3mm thickness ABS. Solid, high impact, purified, color-thru, acid resistant, ABS edging machine-applied with waterproof hot melt adhesives, automatically

trimmed for uniform appearance, buffed 1/8" machine and corner-radiused for consistent design. Use for door/drawer, cabinet vertical end panel and shelving front edges.

K. Cabinet Body Edges: Solid 3mm thick ABS (high impact rated) banding, machine applied with waterproof hot melt adhesives, color matched to door/drawer face laminate.

L. ABS banding shall be available in all of manufacturer's available colors to match basic cabinet body color selected, or in contrasting solid colors as selected by the Architect.

M. Base Cabinet End Frames: To be made of 12 gauge tubular furniture steel (1 ¼" sq.) with concealed, full-penetration welded construction with chamfered index seats for positive align, locking joints via machine-hardened, fine thread 7/32" dia. flathead bolts. End frames and bolts to be powder coat paint finishes as specified by architect.

N. Mechanical Fasteners: Base cabinet frame assembly to be accomplished via insertion of 7/32" diameter by 2" length, machine hardened flat head bolts (flush-mount, hex drive style) through chamfered seats in end frames into 1" diameter, threaded steel inserts welded into ends of horizontal cross members. Positive locking connection to provide a structural frame load rating of 1,000 lbs. per cabinet with active vibration damping.

O. Cross Members: Structural cross members to be of 1" wide x 2" high rectangular tubes of 16 gauge furniture steel with powder coat paint finish as selected. Cross members to contain 7/8" diameter steel inserts (fusion-welded in tube ends) to receive 7/32" flathead bolts inserted through end frames into cross members. Cross members to be fabricated with pre-milled, concealed insert and fastener holes to secure laminate body panels (sides, backs, bases, tops, etc.) to assembled base cabinet structural frames. Provide color match nylon hole plugs to conceal any exposed or semi-exposed fastener insert holes.

P. Shelves: Provide adjustable interior shelves of ¾" or 1" thickness, fabricated of thermally-fused, dual sided laminate industrial grade particleboard substrates (45-60 psi hardness) as applicable per shelf width, with 3mm thickness, high-impact ABS radiused edges at exposed edges. Semi-exposed adjustable shelf edges to be finished with .5mm ABS edging. Shelf adjustment to be on 1 ¼" levels (32mm) on line-bored interior side walls. Provide dual-pin ABS transparent shelf clips with positive-lock tabs for secure, easy adjust shelf placements (shelf clip rating @ 200 lbs. each).

Q. Concealed Fasteners: Body panels (sides, back, bottom) and top securely anchored to frame by insertion of ¾" or 1" L #8 self tap wood screws inserted through machined holes in structural frame members. Fasteners insert through exterior frame opening (3/8" dia.) and anchor body panels to frame through corresponding 3/16" diameter hole in interior frame wall. Fasteners to be concealed inside frame tube with access hole is closed via color coordinated nylon push cap (flush mount) to provide a clean, furniture quality finish with no visible fastener access holes. Push lock caps remove for easy fastener access to remove, repair or update body panels and components.

R. Cabinet Levelers: Base cabinet structural frames to contain 3/8" diameter x 1 ¼" length steel levelers with 1 ¼" diameter plastic glides. Leveler glides to be easily accessible with base

cabinets in final install position to facilitate easy installation and relocation of base cabinets by Owner as desired.

S. Hardware:

1. Hinges: Door hinges to be concealed “European Style” Blum “Inserta” Hinges (Series 71T559/173L8100 or equal) with self-closing, non-drift action. 120° opening, 6-way cam adjust hinge with nickel plate finish. 150lb. load rating per hinge rated at 100,000 cycles minimum with lifetime warranty.
2. Door Hinge Placements: One pair hinges per door up to 36" height. One and one-half pair hinges over 36" in height. Hinges to accommodate 3/4" thick laminated door and allow 120° opening.
3. Pulls: Door and drawer front pulls shall be 96mm wire pulls with powder coat paint or anodized finish. Pull design shall be compatible with Americans with Disabilities Act (ADA), Federal Register Volume 56, No. 144, specifically paragraph 4.27.4. Other pulls may be acceptable pending Architect approval.
4. Cabinet Drawers: Drawer sidewalls and glides to be heavy duty Blum “Metabox” drawer assembly with epoxy painted steel sidewalls with full depth bottom returns for maximum drawer bottom support/load rating (100 lb.) with integral, dual-offset roller glides with self-closing/non-drift action. Drawer fronts to attach via cam action front brackets to allow easy field alignment of drawer reveals. Drawer bottoms, backs and fronts to be of ¾” thickness industrial grade particleboard (45-60 psi hardness) with thermally fused dual sided laminates. Drawer front edges finished with 3mm ABS edge and drawer box semi-exposed and concealed edges to be finished with .5mm ABS.

2.3 FABRICATION

A. Fabricate structural modular casework to dimensions, profiles, and details shown.

B. Base Cabinet Frame System and Components:

1. Cabinet frame to be free-standing structural design to allow easy placement, leveling and relocation of base cabinets on demand. Freestanding structural frame shall be designed to support 1000 lbs. dynamic load. Vertical frame members to be of 12 gauge furniture steel. Horizontal frame members to be of 16 gauge furniture steel (minimum). Frame connection joints to be attached via flush-mount 3/8” diameter, machine hardened flathead bolts (2” length) inserted through chamfered seats in end frame members (12 gauge) into 7/8” diameter by ¾” length threaded steel inserts (welded in ends of horizontal members). Vertical end frames to have 1 1/8” diameter x 1” length threaded steel inserts welded in bottoms to receive 3/8” diameter steel glide (with1¼” diameter plastic foot) to allow easy leveling of base cabinets on installation and relocation. All frame welds to be concealed, full penetration style for maximum frame strength and to provide a smooth furniture quality exterior finish. All frame members to be powder coat paint finished (finish as selected from manufacturer’s standards). Cabinet frames to be

precision machined to accept a suite of modular components (shelves, sides, drawers, doors, backs, files, etc.) on original factory assembly or in field at subsequent date as desired. All frames to be "mobile ready" to accept standard or heavy duty casters (furniture or industrial) for conversion of base cabinets to mobile cabinets as needed.

C. Base Cabinet Modular Components:

1. Modular cabinet components forming exterior surfaces and accessories to be manufactured of ¾" thickness, 45-65 psi industrial grade, 100% recycled particleboard substrates that meet or exceed ANSI standard A.208 1-1999 for strength, thickness, and surface smoothness. All wood components to have dual-sided, thermally fused laminate finish (no exposed phenolic backer sheets or raw wood surfaces). All exposed panel edges to be thermally pressure bonded, radiused, 3mm thickness ABS edges (high impact rated). Surface and edge finishes and color as specified.

D. Drawer Modules and Hinged Door Sets:

1. Drawer modules and hinged door inserts to be available in 15", 18", 24" and 36" width (nominal) increments which can be installed as original components or added/removed at a later date in field. Drawer glides to be dual offset roller design movement with a minimum 100 lb. load rating per drawer (400 lb. per 4 drawer module). Drawer movement to be full extension, self-closing, non-drift design (Blum "Metabox" Box/File Series 320M5000C15.33OH500PCI5 or equal). Drawer front hardware to be detachable / changeable design with 4-way field adjustment for achievement of consistent horizontal and vertical reveals. Drawer sides to be epoxy painted, stamped steel panels with full-length bottom support angle for maximum load bearing and extended service life. Drawer bottoms to be of ¾" thickness, 45-65 psi industrial particleboard with dual sided thermoset laminate finish (white). Drawer front edges to be impact resistant 3 mm thickness, solid ABS edges. Hinged door panels to feature 120º opening, 6 way adjustable, clip on/off concealed hinge system (Blum Series ZSF1300R & ZSF1300L or equal). Door panels to be of ¾" inch thickness 45-65 psi industrial particleboard substrate with dual-sided thermoset laminate finish and solid 3 mm thickness ABS on all edges. Finishes as specified from manufacturer's standards.

E. Wall Cabinets (Modular, Demountable Style):

1. Sizes: Standard wall cabinets to be available in 24", 30", and 36" widths by 30" high (15¾" deep with door).

2. Construction:

a. Wall cabinet body, doors and shelves to be constructed of minimum ¾" thickness, 45-65 psi industrial particleboard substrates that meet or exceed ANSI standard A.208 1-1999 for strength, thickness and surface smoothness. Cabinet back to be integral, single panel MDF substrate of 45 psi density, minimum ¼" thickness.

b. Door edging to be high impact resistant, 3mm thickness ABS, thermally pressure-bonded to all door edges. Cabinet body and interior shelves to have .5mm thickness ABS, thermally bonded to all semi-exposed edges.
c. Door hinge system to be concealed, self-closing 35 mm "cup-style" with nickel plated clip-on/off, 6-way adjust hinges (Blum "Inserta" Hinge/Clip Series 71T559/173L8100 or equal). Door pulls to be natural, satin finish aluminum, 96 mm grip, ADA approved wire pulls or equal.
d. Wall Cabinet body assembly to be accomplished via interlocking point-to-point steel cam and dowel system (Hafele Element/Cam Series 262.27.921262.26.826 or equal), permitting easy change of body components "on-demand". Cabinets shipped assembled for easy field install. Cabinet construction to include integral fully-plowed one piece back for maximum cabinet strength and squareness under fully loaded condition.
e. Wall anchoring to be achieved via integral anchoring brackets, factory installed in upper interior cabinet rear corners. Anchoring brackets to feature vertical leveling (1" range) with locking brackets (Blum Series 48N0510 or equal) to attach cabinet body to wall mounted Zip Rails (Hafele Series 290.11.900 or equal) attached to wall studs, blocking and/or backing. Cabinet construction to include concealed, dual anchoring cross members (inset full width, ¾" thickness by 3½" height) to enable secure cabinet anchoring for additional load and/or seismic requirements.
f. Wall cabinet load rating to be 175 lbs. (contents) maximum per cabinet based on standard attachment and anchoring method.
g. Wall Cabinet Accessories: Standard wall cabinet accessories to include adjustable shelves (3/4" thickness, dual-sided finish with .5 mm solid ABS edges), shelf locking cams (to prevent accidental "tip-out") and steel support pins (adjustable on 1¼" levels).

F. Filler Strips: Provide fillers as needed to close spaces between cabinets and walls, ceiling, and indicated equipment. Fabricate from same material and with same finish as cabinet fronts.

G. Countertops:

1. Countertops are TBD and specified separately by architect and Owner.

H. Electrical Fixtures:

1. Electrical Fixtures: part of, or installed in the equipment, approved by National Board of Underwriters and must conform to City and State Building Codes.

PART 3 - EXECUTION

3.1 INSPECTION AND PREPARATION

A. Installer must field verify site dimensions and conditions where work is to be installed and notify architect of any non-conforming conditions that will affect completed installation of

structural modular casework in full compliance with manufacturer's recommended installation procedures. Installer must coordinate interface conditions between casework and the work of other trades for blocking within walls, plumbing, ductwork, electrical work and the like.

B. Condition modular casework to average prevailing humidity conditions in installation area prior to installing.

3.2 INSTALLATION

A. Install casework in accordance with AWI's "Architectural Woodwork Quality Standards" Section 1700 with factory-trained supervision authorized by the manufacturer. Erect the work plumb, level true and straight with no distortions, shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level (including countertops); and with 1/16" maximum offset in flush adjoining surfaces, 1/8" maximum offsets in revealed adjoining surfaces.

B. Scribe and cut work to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts to original factory finish.

C. Anchor casework to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners plugged to match and blind nailing as required for a complete installation.

D. Cabinets: Install without distortion so that doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated.

E. Tops: Anchor securely to base units and other support systems as indicated.

3.3 ADJUSTMENT, CLEANING AND PROTECTION

A. Repair or remove and replace damaged and defective casework as directed upon completion of installation.

B. Clean laminate casework surfaces on exposed and semi-exposed surfaces. Repair minor damage per plastic laminate manufacturer's recommendations. Replace other damaged parts or units.

C. Complete and finish work specified as work of this section, to whatever extent not completed at shop.

D. Installer of architectural casework to advise General Contractor of final protection and maintenance requirements necessary to ensure that work will be without damage or deterioration at time of acceptance.

END OF SECTION 123200.

SECTION 123216 - MANUFACTURED PLASTIC-LAMINATE-FACED CASEWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes plastic-laminate-faced cabinets of stock design.

1.2 DEFINITIONS

A. Definitions in the AWI's, AWMAC's, and WI's "Architectural Woodwork Standards" apply to the work of this Section.

B. MDF: Medium-density fiberboard.

C. Hardwood Plywood: A panel product composed of layers or plies of veneer, or of veneers in combination with lumber core, hardboard core, MDF core, or particleboard core, joined with adhesive, and faced both front and back with hardwood veneers.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Samples: For cabinet finishes.

1.4 INFORMATIONAL SUBMITTALS

A. Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.5 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of casework that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Delamination of components or other failures of glue bond.
b. Warping of components.
c. Failure of operating hardware.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain plastic-laminate-faced cabinets from single manufacturer.

2.2 CASEWORK, GENERAL

A. Quality Standard: Unless otherwise indicated, comply with the AWI's, AWMAC's, and WI's "Architectural Woodwork Standards" for grades of casework indicated for construction, finishes, installation, and other requirements.

1. Grade: Custom.
2. Provide certificates from AWI certification program indicating that casework complies with requirements of grades specified.

B. Product Designations: Drawings indicate sizes, configurations, and finish materials of manufactured plastic-laminate-faced cabinets.

2.3 CASEWORK

A. Design:

1. Flush overlay.

B. Exposed Materials:

1. Plastic Laminate: Grade HGS.

a. Colors and Patterns: As selected by Architect from manufacturer's full range.

2. Unless otherwise indicated, provide specified edgebanding on all exposed edges.
3. Solid Wood: Clear hardwood lumber of species indicated, selected for compatible grain and color.
4. Wood Species: Red oak.

C. Semiexposed Materials:

1. Plastic Laminate: Grade VGS unless otherwise indicated. Provide plastic laminate for semiexposed surfaces unless otherwise indicated.

a. Provide plastic laminate of same grade as exposed surfaces for interior faces of doors and drawer fronts and other locations where opposite side of component is exposed.

2.4 MATERIALS

A. Hardwood Plywood: HPVA HP-1, particleboard core except where veneer core is indicated.

B. Softwood Plywood: DOC PS 1.

C. Particleboard: ANSI A208.1, Grade M-2.

D. MDF: ANSI A208.2, Grade 130 .

E. Hardboard: ANSI A135.4, Class 1 Tempered.

F. Plastic Laminate: High-pressure decorative laminate complying with NEMA LD 3.

G. Edgebanding for Plastic Laminate: Plastic laminate matching adjacent surfaces.

2.5 COLORS AND FINISHES

A. Wood Colors and Finishes: As selected by Architect from casework manufacturer's full range.

B. Plastic-Laminate Colors, Patterns, and Finishes: As selected by Architect from plastic-laminate manufacturer's full range.

2.6 CASEWORK HARDWARE AND ACCESSORIES

A. Hardware, General: Unless otherwise indicated, provide manufacturer's standard mirror polished-finish, commercial-quality, heavy-duty hardware.

1. Use threaded metal or plastic inserts with machine screws for fastening to particleboard except where hardware is through-bolted from back side.

B. Frameless Concealed Hinges (European Type): BHMA A156.9, Type B01602, 135 degrees of opening**,** self-closing. Provide two hinges for doors less than 48 inches (1220 mm) high, and provide three hinges for doors more than 48 inches (1220 mm) high.

C. Pulls: Solid stainless-steel or chrome-plated brass wire pulls, fastened from back with two screws. Provide two pulls for drawers more than 24 inches (600 mm) wide.

D. Drawer Slides: BHMA A156.9, Type B05091.

E. Drawer and Hinged Door Locks: Cylindrical (cam) type, five-pin tumbler, brass with chrome-plated finish, and complying with BHMA A156.11, Grade 1.

PART 3 - EXECUTION

3.1 CASEWORK INSTALLATION

A. Grade: Install cabinets to comply with same grade as item to be installed.

B. Install casework level, plumb, and true; shim as required, using concealed shims. Where casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.

C. Base Cabinets: Set cabinets straight, level, and plumb. Adjust subtops within 1/16 inch (1.5 mm) of a single plane. Align similar adjoining doors and drawers to a tolerance of 1/16 inch (1.5 mm). Bolt adjacent cabinets together with joints flush, tight, and uniform.

D. Wall Cabinets: Hang cabinets straight, level, and plumb. Adjust fronts and bottoms within 1/16 inch (1.5 mm) of a single plane. Fasten to framing, sheet metal blocking, or reinforcements in walls and partitions. Align similar adjoining doors to a tolerance of 1/16 inch (1.5 mm).

E. Fasten cabinets to adjacent cabinets and to framing, blocking, or reinforcements in walls and partitions to comply with the AWI's, AWMAC's, and WI's "Architectural Woodwork Standards."

F. Adjust casework and hardware so doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

3.2 CLEANING

A. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.

END OF SECTION 123216

SECTION 123623.13 - PLASTIC-LAMINATE-CLAD COUNTERTOPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes plastic-laminate countertops.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product**,** including high-pressure decorative laminate, adhesive for bonding plastic laminate

B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

1. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, installed in plastic-laminate countertops.
2. Apply WI Certified Compliance Program label to Shop Drawings.
3. Apply AWI Quality Certification Program label to Shop Drawings.

C. Samples for Initial Selection:

1. Plastic laminates.

D. Samples for Verification:

1. Plastic laminates, 12 by 12 inches for each type, color, pattern, and surface finish, with one sample applied to core material and specified edge material applied to one edge.
2. Wood-grain plastic laminates, 24 by 24 inches, for each type, with one sample applied to core material and specified edge material applied to one edge.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and Fabricator.

B. Product Certificates: For each type of product.

1. High-pressure decorative laminate.
2. Adhesives.

C. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates

D. Evaluation Reports: For fire-retardant-treated materials, from ICC-ES.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance. Shop is a certified participant in AWI's Quality Certification Program.

B. Delete "Installer Qualifications" Paragraph below if not required or available. If woodwork must be FSC certified for LEED, fabricator must either install woodwork or be FSC certified for chain of custody.

C. Installer Qualifications: Certified participant in AWI's Quality Certification Program

D. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver countertops until painting and similar operations that could damage countertops have been completed in installation areas. If countertops must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 25 and 55 percent during the remainder of the construction period.

C. Field Measurements: Where countertops are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

D. Established Dimensions: Where countertops are indicated to fit to other construction, establish dimensions for areas where countertops are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 PLASTIC-LAMINATE COUNTERTOPS

A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades indicated for construction, installation, and other requirements.

1. Provide labels or certificates from AWI certification program indicating that countertops**,** including installation, comply with requirements of grades specified.
2. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with those selections and requirements in addition to the quality standard.

B. Grade: Premium.

C. High-Pressure Decorative Laminate: NEMA LD 3, Grade HGS

1. Formica Corporation

2. Wilsonart

3. Nevamar

D. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:

1. As indicated by manufacturer's designations.
2. Match Architect's sample.
3. As selected by Architect from manufacturer's full range in the following categories:

    a. Solid colors, matte finish.
    b. Solid colors with core same color as surface matte finish.
    c. Wood grains, matte finish.
    d. Patterns, matte finish.

4. Grain Direction: Parallel to cabinet fronts.

E. Edge Treatment: Same as laminate cladding on horizontal surfaces.

F. Core Material: Particleboard or medium-density fiberboard.

G. Core Material at Sinks: Particleboard made with exterior glue.

H. Core Thickness: 3/4 inch

1. Build up countertop thickness to 1-1/2 inches at front, back, and ends with additional layers of core material laminated to top.

I. Backer Sheet: Provide plastic-laminate backer sheet, NEMA LD 3, Grade BKL, on underside of countertop substrate.

J. Paper Backing: Provide paper backing on underside of countertop substrate.

2.2 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard unless otherwise indicated.

1. Wood Moisture Content: 5 to 10 percent.

2.3 MISCELLANEOUS MATERIALS

A. Adhesive for Bonding Plastic Laminate: Unpigmented contact cement Retain "Adhesive for Bonding Edges" Subparagraph below unless good chemical, fire, or temperature resistance is required.

1. Adhesive for Bonding Edges: Hot-melt adhesive

2.4 FABRICATION

A. Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.

B. Fabricate countertops to dimensions, profiles, and details indicated. Provide front and end overhang of 1 inch over base cabinets. Ease edges to radius indicated for the following:

1. Solid-Wood (Lumber) Members: 1/16 inch unless otherwise indicated.

C. Complete fabrication, including assembly, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.

D. Shop cut openings to maximum extent possible to receive appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

1. Seal edges of openings in countertops with a coat of varnish.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before installation, condition countertops to average prevailing humidity conditions in installation areas.

B. Before installing countertops, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

A. Grade: Install countertops to comply with same grade as item to be installed.

B. Assemble countertops and complete fabrication at Project site to the extent that it was not completed in the shop.

1. Provide cutouts for appliances, plumbing fixtures, electrical work, and similar items.
2. Seal edges of cutouts by saturating with varnish.

C. Field Jointing: Where possible, make in the same manner as shop jointing, using dowels, splines, adhesives, and fasteners recommended by manufacturer. Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required. Locate field joints where shown on Shop Drawings.

1. Secure field joints in plastic-laminate countertops with concealed clamping devices located within 6 inches of front and back edges and at intervals not exceeding 24 inches. Tighten according to manufacturer's written instructions to exert a constant, heavy-clamping pressure at joints.

D. Install countertops level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.

E. Scribe and cut countertops to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

F. Fire-Retardant-Treated Wood: Handle, store, and install fire-retardant-treated wood to comply with chemical treatment manufacturer's written instructions, including those for adhesives used to install woodwork.

G. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.

1. Install countertops with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
2. Secure backsplashes to tops with concealed metal brackets at 16 inches o.c. and to walls with adhesive.
3. Seal junctures of tops, splashes, and walls with mildew-resistant silicone sealant or another permanently elastic sealing compound recommended by countertop material manufacturer.

3.3 ADJUSTING AND CLEANING

A. Repair damaged and defective countertops, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

B. Clean countertops on exposed and semi exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 123623.13

American Standard

BARRIER FREE

LUCERNE™ WALL-HUNG LAVATORY
VITREOUS CHINA

LUCERNE™ WALL-HUNG LAVATORY

- Wall-hung sink
- Vitreous china
- Front overflow
- D-shaped bowl
- Self-draining deck area with contoured back and side splash shields
- Faucet ledge
- Compliant with Texas accessibility standard (TAS) for children age group 13 and up

Faucet holes on 203mm (8") centers (Illus.):

❑ **0356.028** For exposed bracket support
Shown with 4801.862 Amarilis Heritage faucet with Triune Cross handles (not included)

❑ **0356.015** For wall hanger (included) or concealed arms support

❑ **0356.915** For wall hanger (included) or concealed arms support
- Less overflow

Faucet holes on 102mm (4") centers:

❑ **0355.027** For exposed bracket support

❑ **0355.012** For wall hanger (included) or concealed arms support

❑ **0355.912** For wall hanger (included) or concealed arms support
- Less overflow

Single center faucet hole (Illus.):

❑ **0356.041** For exposed bracket support
Shown with 1340.000 metering faucet (not included)

❑ **0356.421** For wall hanger (included) or concealed arms support

❑ **0356.921** For wall hanger (included) or concealed arms support
- Less overflow

❑ **0356.439** For wall hanger (included) or concealed arms support
- Single faucet hole on right

❑ **0356.066** For exposed bracket support
- Single faucet hole on right

Nominal Dimensions:
521 x 464mm
(20-1/2" x 18-1/4")

Bowl sizes:
381mm (15") wide
254mm (10") front to back
165mm (6-1/2") deep

Compliance Certifications -
Meets or Exceeds the Following Specifications:
- ASME A112.19.2 / CSA B45.1 for Vitreous China Fixtures

0356.028

0356.041

SEE FOLLOWING PAGES FOR ROUGHING-IN DIMENSIONS

To Be Specified:
- ❑ Color: ❑ White
- ❑ Faucet*:
- ❑ Faucet Finish:
- ❑ Supplies:
- ❑ 1-1/4" Trap:
- ❑ Nipple:
- ❑ Bracket Support (by others):
- ❑ Concealed Arms Support (by others):

* See faucet section for additional models available

MEETS THE AMERICANS WITH DISABILITIES ACT GUIDELINES AND ANSI A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES - CHECK LOCAL CODES.
Top of front rim mounted 864mm (34") from finished floor.

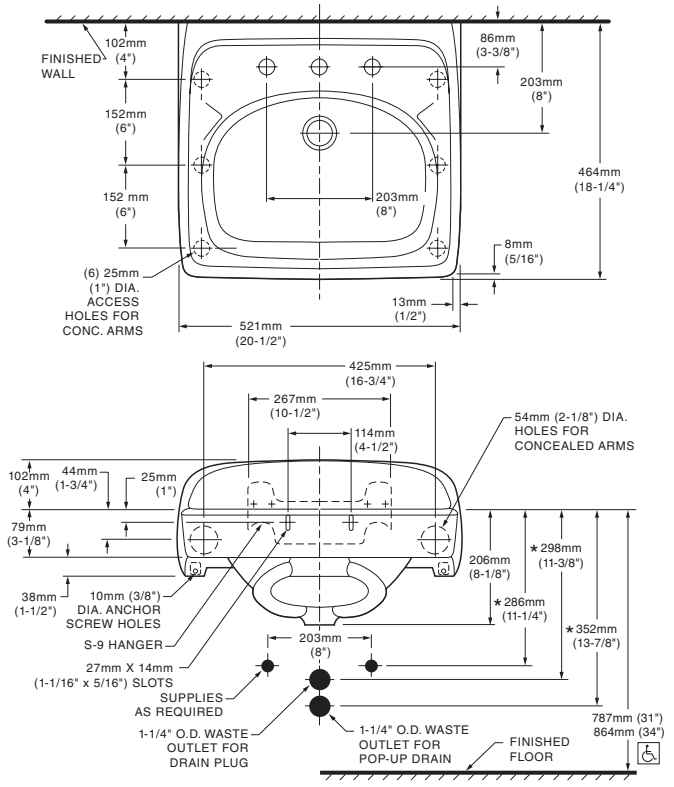
Revised 3/14

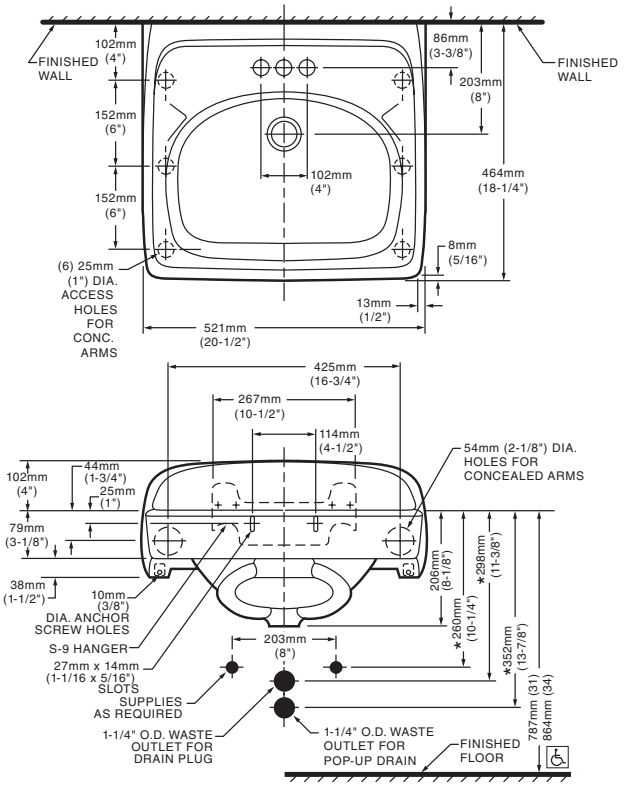
LUCERNE™
WALL-HUNG LAVATORY
VITREOUS CHINA

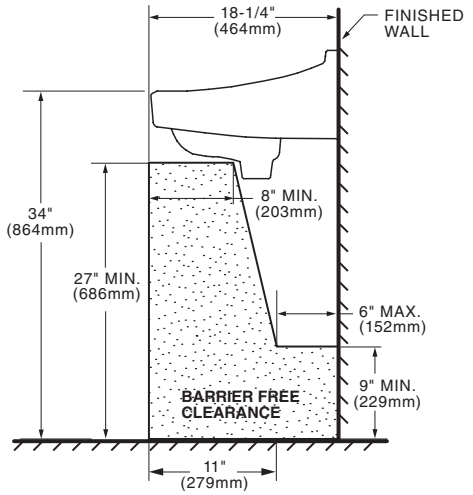
BARRIER FREE

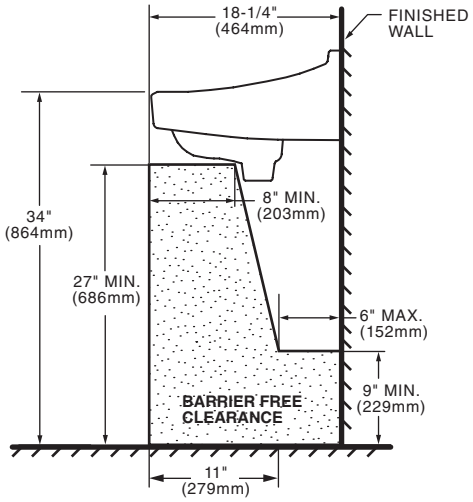
0356.028 8" CTRS FOR EXPOSED BRACKET SUPPORT
0356.015 8" CTRS FOR WALL HANGER OR CONCEALED ARMS
0356.915 LESS OVERFLOW

0355.021 4" CTRS FOR EXPOSED BRACKET SUPPORT
0355.012 4" CTRS FOR WALL HANGER OR CONCEALED ARMS
0355.912 LESS OVERFLOW









NOTES:
* DIMENSIONS SHOWN FOR LOCATION OF SUPPLIES AND "P" TRAP ARE SUGGESTED.
PROVIDE SUITABLE REINFORCEMENT FOR ALL WALL SUPPORTS.
FITTINGS NOT INCLUDED AND MUST BE ORDERED SEPARATELY.
CONCEALED ARM SUPPORT AS REQUIRED TO BE FURNISHED BY OTHERS.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A112.19.2. These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages.

LAVATORY DESIGNED TO MEET ADA HANDICAPPED GUIDELINES WITH MOUNTING HEIGHT SET AT 864MM (34") ABOVE FINISHED FLOOR.

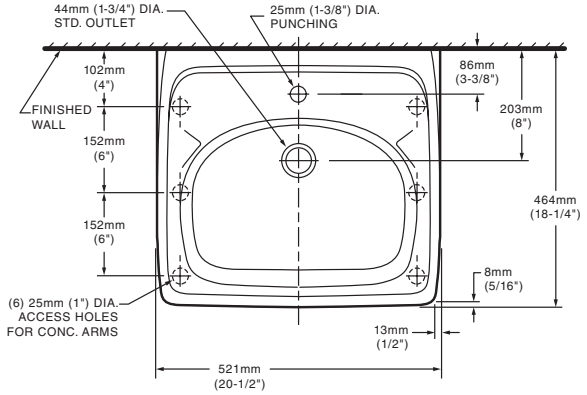
LUCERNE™
WALL-HUNG LAVATORY
VITREOUS CHINA

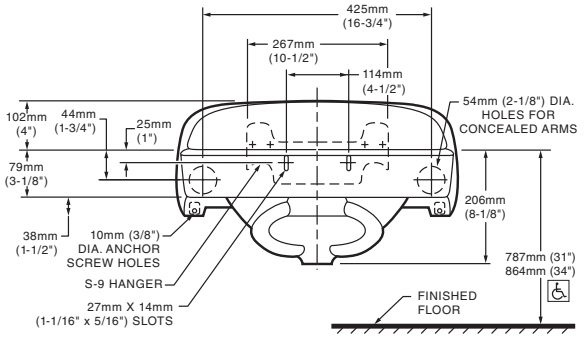
BARRIER FREE

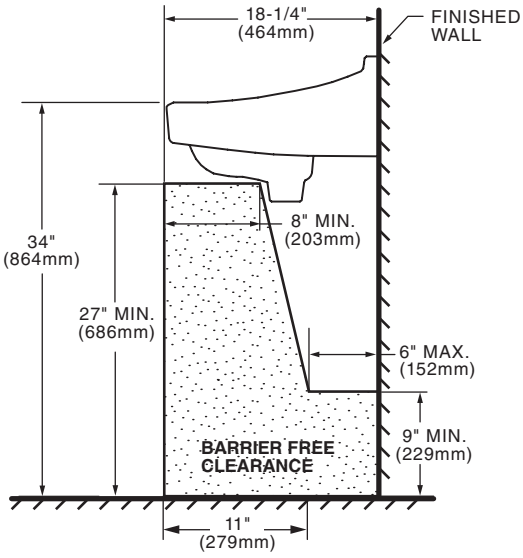
0356.041 SINGLE CENTER HOLE FOR EXPOSED BRACKET SUPPORT

0356.421 SINGLE CENTER HOLE FOR WALL HANGER OR CONCEALED ARMS

0356.921 LESS OVERFLOW

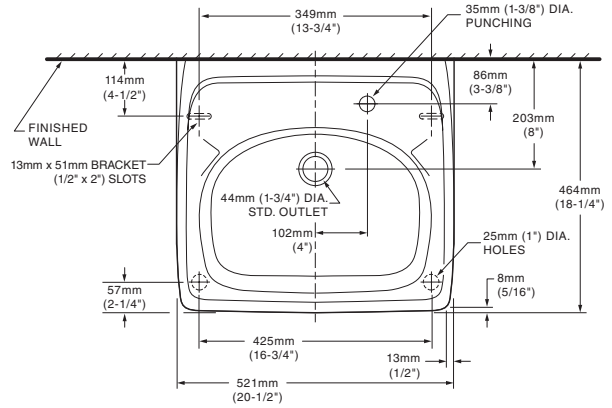


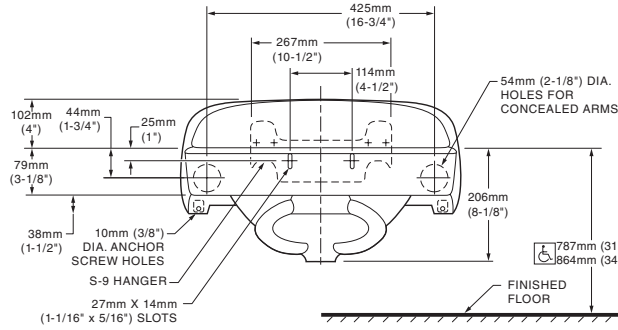


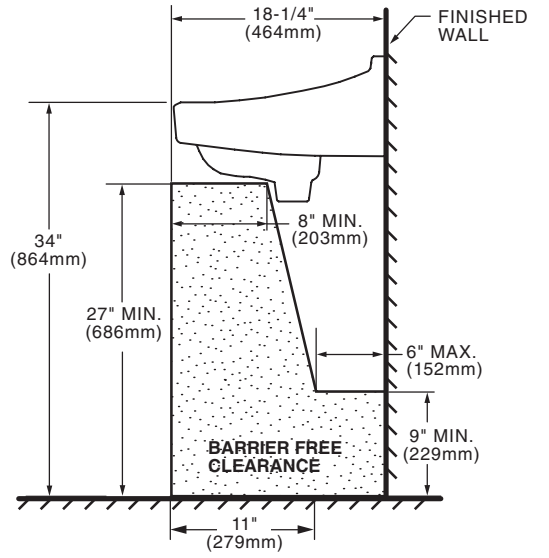


0356.439 SINGLE CENTER HOLE ON RIGHT FOR WALL HANGER OR CONCEALED ARMS

0356.066 SINGLE CENTER HOLE ON RIGHT FOR EXPOSED BRACKET SUPPORT





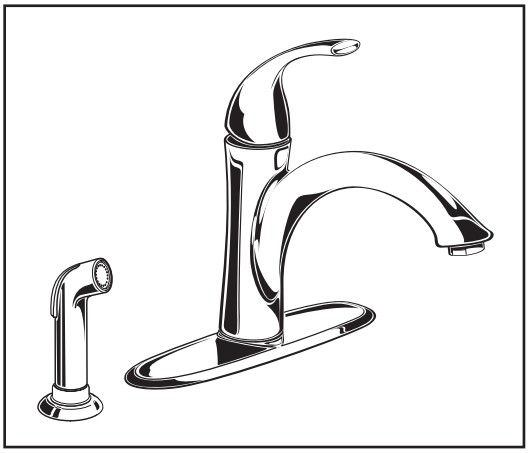


NOTES:
***** DIMENSIONS SHOWN FOR LOCATION OF SUPPLIES AND "P" TRAP ARE SUGGESTED.
PROVIDE SUITABLE REINFORCEMENT FOR ALL WALL SUPPORTS.
FITTINGS NOT INCLUDED AND MUST BE ORDERED SEPARATELY.
CONCEALED ARM SUPPORT AS REQUIRED TO BE FURNISHED BY OTHERS.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A112.19.2. These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages.

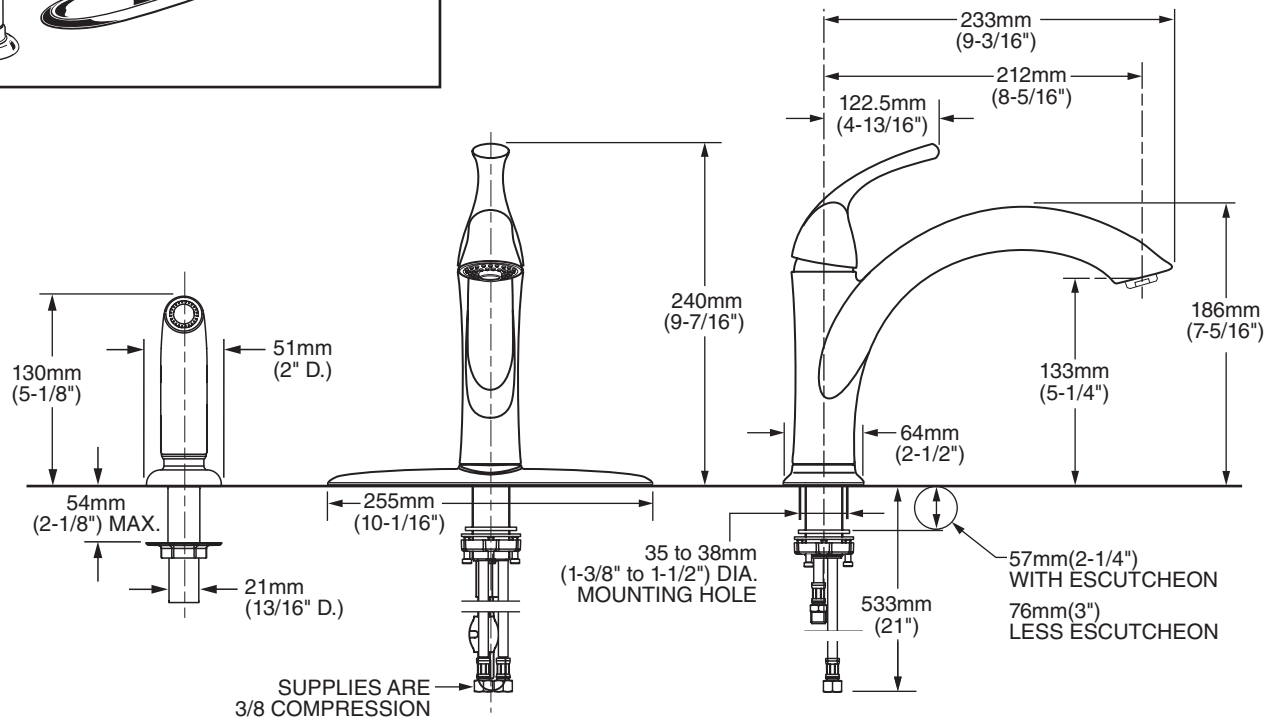
LAVATORY DESIGNED TO MEET ADA HANDICAPPED GUIDELINES WITH MOUNTING HEIGHT SET AT 864MM (34") ABOVE FINISHED FLOOR.

QUINCE™
SINGLE CONTROL KITCHEN FAUCET
WITH CAST BRASS SPOUT



MODEL NUMBER:

- ❑ **4433.001 Kitchen Faucet**
  Separate color-matched handspray.
- ❑ **4433.001.F15 Kitchen Faucet**
  Separate color-matched handspray.



GENERAL DESCRIPTION:

Cast brass body and swivel spout (360˚ rotation). Metal escutcheon plate and metal lever handle. Washerless 40mm ceramic disc valve cartridge. Braided flexible Stainless Steel supply hoses with 3/8" compression connections. 2.2 gpm/8.3 L/min. maximum flow rate, 1.5 gpm/5.7 L/min, maximum flow rate for F15 models. Metal mounting shank with brass fixation ring (for installation on counters up to 2"). Can be mounted with or without supplied escutcheon plate (escutcheon size 10-1/16"L x 2-1/2"W). Color-matched hand spray. Cap provided for less spray applications.

PRODUCT FEATURES:

Ceramic Disc Valve Cartridge: Assures a lifetime of drip-free performance.

Cast Brass Spout: High quality faucet materials for durability and long life.

Memory Position Valving: Allows user to turn valve on and off at preferred temperature setting without readjusting handle position each time.

Lead Free: Faucet contains ≤ 0.25% total lead content by weighted average.

SUGGESTED SPECIFICATION:

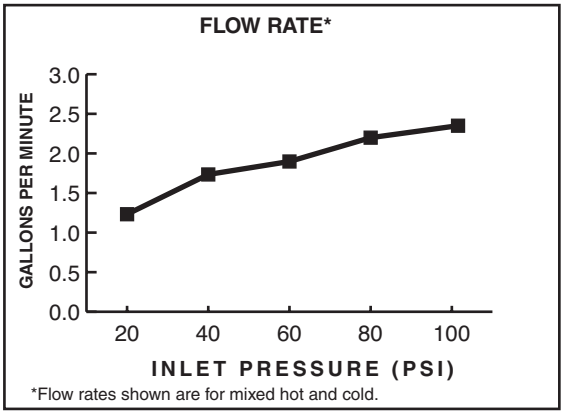
Single control kitchen faucet shall feature a cast brass body and swivel spout, and all metal handle. Shall also feature washerless 40mm ceramic disc valve cartridge and flexible Stainless Steel supply hoses. Fitting shall be American Standard Model # 4433.001.____.____.

Revised 3/14

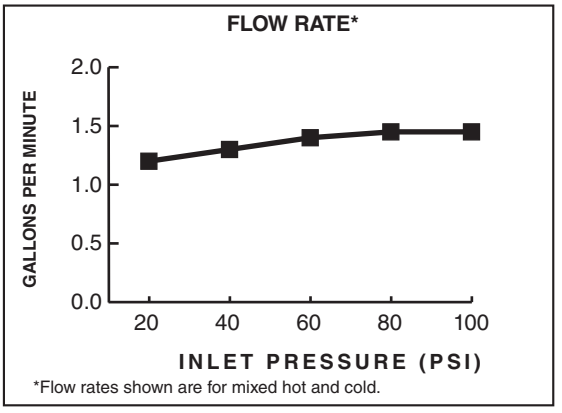
CODES AND STANDARDS

These products meet or exceed the following codes and standards:

ANSI A117.1
ASME A112.18.1
CSA B 125
NSF 61/Section 9 & Annex G



2.2 gpm/8.3 L/min. FLOW RATE

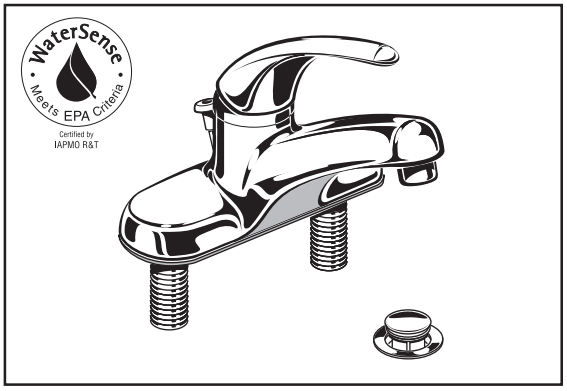


1.5 gpm/5.7 L/min. FLOW RATE

Product Number	Description	Finish Options		
		Polished Chrome	Stainless Steel (PVD)	Oil Rubbed Bronze
		002	075	224
4433.001	Kitchen Faucet with Side Spray - 2.2 gpm/8.3 L/min. maximum flow rate			
4433.001.F15	Kitchen Faucet with Side Spray - 1.5 gpm/5.7 L/min. maximum flow rate			

Meets the American Disabilities Act Guidelines and **ANSI A117.1** Requirements for the physically challenged.

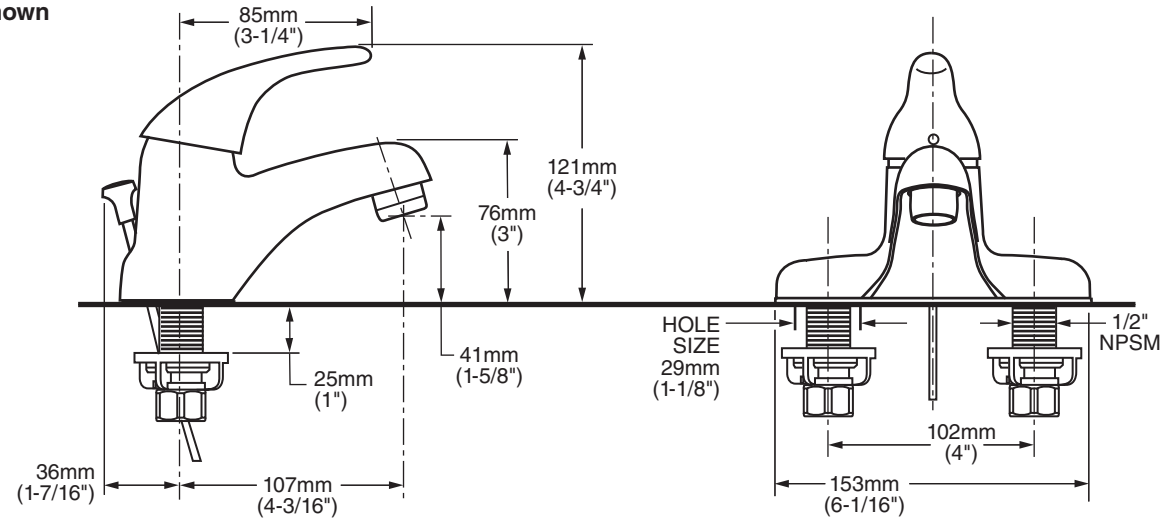
COLONY® SOFT
SINGLE CONTROL LAVATORY FAUCET



2175.500 Shown

MODEL NUMBER:

- ❑ **2175.500 Colony Soft Single Control Centerset**
  Metal Lever Handle. 50/50 Pop-up drain.
- ❑ **2175.506 Colony Soft Single Control Centerset**
  Metal Lever Handle. Grid drain. Less pop-up rod and hole.
- ❑ **2175.505 Colony Soft Single Control Centerset**
  Metal Lever Handle. Less drain. With pop-up hole, plug button and rod.
- ❑ **2175.504 Colony Soft Single Control Centerset**
  Metal Lever Handle. Less drain. Less pop-up rod and hole.



GENERAL DESCRIPTION:

Single control lavatroy faucet on 4" centers. Washerless 40mm ceramic disc valve cartridge with integral hot limit safety stop. Durable cast brass waterway with 1/2" male threaded brass inlet shanks. Metal body with color matched underbody. Metal lever handle with large "comfort zone". 1.5 gpm/5.7L/min. maximum flow rate.

PRODUCT FEATURES:

Cast Brass Waterways with "City Shanks": Strong and durable. Integral tabs on casting provide a wobble-free installation.

Ceramic Disc Valve Cartridge: Assures a lifetime of drip-free performance.

Adjustable Hot Limit Safety Stop: Limits the amount of hot water allowed to mix with cold. Reduces the risk of accidental scalding.

Lead Free: Faucet contains ≤ 0.25% total lead content by weighted average.

Longer Spout: Provides extended reach into lavatory.

Memory Position Valving: Allows user to turn valve on and off at preferred temperature setting without readjusting handle position each time.

Large "Comfort Zone": Allows easy fine tuning of temperature.

Simple Installation: Fast and easy one person installation. Faucet drops in from top. Quick spin nuts secure faucet in place.

SUGGESTED SPECIFICATION:

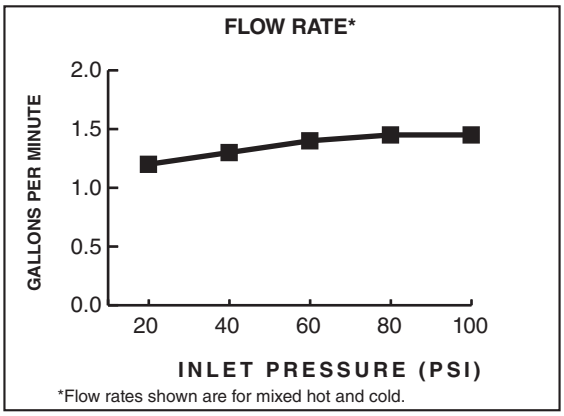
Single control lavatory fitting shall feature cast brass waterways with 1/2" male inlet shanks. Shall also feature washerless 40mm ceramic disc valve cartridge with integral hot limit safety stop. Fitting shall be American Standard Model # 2175.____.____.

Revised 3/12

CODES AND STANDARDS

These products meet or exceed the following codes and standards:

ANSI A117.1
ASME A112.18.1
NSF 61/Section 9 and Annex G
CSA B 125



Product Number	Description	Finish Options	
		Polished Chrome	PVD Satin Nickel
		002	295
2175.500	Colony Soft Single Control Centerset. 50/50 Pop-up drain.		
2175.506	Colony Soft Single Control Centerset. Grid drain. Less pop-up rod and hole.		**N/A**
2175.505	Colony Soft Single Control Centerset. Less drain. With pop-up rod and hole.		**N/A**
2175.504	Colony Soft Single Control Centerset. Less drain. Less pop-up rod and hole.		**N/A**

N/A = Not Available

Meets the American Disabilities Act Guidelines and **ANSI A117.1** Requirements for the physically challenged.

		Available Modifications*	Part Suffix
Flow Control Options		Non-Aerated 0.5gpm/1.9L/min. PCA Spray	__**F05**
		Vandal-Resistant Non-Aerated 0.5gpm/1.9L/min. PCA Spray	__**V05**
		1.0gpm/3.8L/min. PCA Aerator	__**F10**
		Vandal-Resistant 1.0gpm/3.8L/min. PCA Aerator	__**V10**
		Vandal-Resistant 1.5gpm/5.7L/min. PCA Aerator	__**V15**
		Non-Aerated Laminar PCA 1.5gpm/5.7L/min. Flow Outlet	__**L15**

*Modified product models are NOT Water Sense certified.

Cadet 3 Tall Height Complete Elongated Toilet with Lined Tank

3.3 | (3)

WRITE A REVIEW

READ REVIEWS

MODEL NUMBER: 3378.528ST

VIEW ALL FIXTURES & COMPONENTS

Use the Cadet 3 FloWiseToilet to update your bathroom. Its WaterSense-certified design uses 1.28 GPF to help conserve water and its Cadet 3 flushing system allows for a powerful flush.

DISCOVER THIS PRODUCT'S FEATURES AND READ FULL DESCRIPTION

LEARN MORE ABOUT THIS PRODUCT
Full Product Description & Features
Downloads & Related Links
Fixtures & Components Details
Product Reviews
Ask An Expert
Parts
Related Products

Images Videos

YouTube 3K

CADET 3 TALL HEIGHT COMPLETE ELONGATED TOILET WITH LINED TANK SHOWN IN WHITE(020)

Available Colors & Finishes (Click to view large image of product in color)

White (020)

Images

About This Product

Use the Cadet 3 FloWiseToilet to update your bathroom. Its WaterSense-certified design uses 1.28 GPF to help conserve water and its Cadet 3 flushing system allows for a powerful flush.

DOWNLOADS
Installation Instructions

DESCARGAS
Instrucciones de instalación

KEY FEATURES & INNOVATIONS
5 Year Warranty
ADA Compliant
Water Efficient
Right Height

2-piece design features a separate tank and bowl
Elongated bowl for greater comfort
WaterSense certified high-efficiency design uses 1.28 gpf for significant water savings
Constructed with durable vitreous china for cleaner, long-lasting use
Cadet 3 flushing system with 2-1/8 in. glazed trapway and oversized 3 in. flush valve for a powerful flush
Includes plastic seat and cover with EverClean surface
Everclean surface inhibits the growth of stain and odor-causing bacteria, mold, and mildew
5 Year Warranty
Available in White

Fixtures & Components | Parts

Main Fixtures

3378.528ST - Cadet 3 Toilet with Lined Tank
Estimated List Price: Check your local Home Depot

Product Reviews | Ask an Expert | Comments

Reviews

WRITE A REVIEW

Rating Snapshot	
Select a row below to filter reviews.	
5★	1
4★	1
3★	0
2★	0
1★	1

Average Customer Ratings	
Overall	3.3
Design/Style	3.7
Performance	3.3
Quality	4.0

1–3 of 3 Reviews

Sort

★★★★★ PLZF · a year ago

I'm very pleased with our new toilet. According to "the man" it was a quick and easy installation and it looks very sleek and stylish (for a toilet)! Happy with my purchase.

Design/Style

Performance

Quality

Yes, I recommend this product.

Helpful? **Yes · 0** | **No · 0** **Report**

★★★★★ sal64 · a year ago
poor flush

toilet clogs 1/2 the time hole to small and not enough water need to redezin all toilets

Design/Style

Performance

No, I do not recommend this product.

Continue Survey

Quality

Helpful? Yes · 0 | No · 0 Report

★★★★★ PooperScooper · 11 months ago

Great toilet

I think this is the Best toilet for your hard earned money.

Design/Style

Performance

Yes, I recommend this product.

Quality

Helpful? Yes · 0 | No · 0 Report

BROWSE RELATED PRODUCTS: By Category: Toilets By Collection Search For Other Products Like This

Cadet3 Right Height Round Front toilet with a 10inch rough-in

★★★★★

Esteem VorMax Right Height Elongated 1.28gpf Toilet

★★★★★ 5.0

Ultima VorMax High Efficient Right Height Elongated Complete Toilet

★★★★★ 5.0

Astute VorMax Right Height Elongated Toilet

★★★★★ 4.8

Reliant Round Front Complete Toilet

★★★★★

BACK TO TOP

American Standard

Style That Works Better

BARRIER FREE

OVALYN UNIVERSAL ACCESS™ UNDERCOUNTER SINK

VITREOUS CHINA

OVALYN UNIVERSAL ACCESS™ SINK

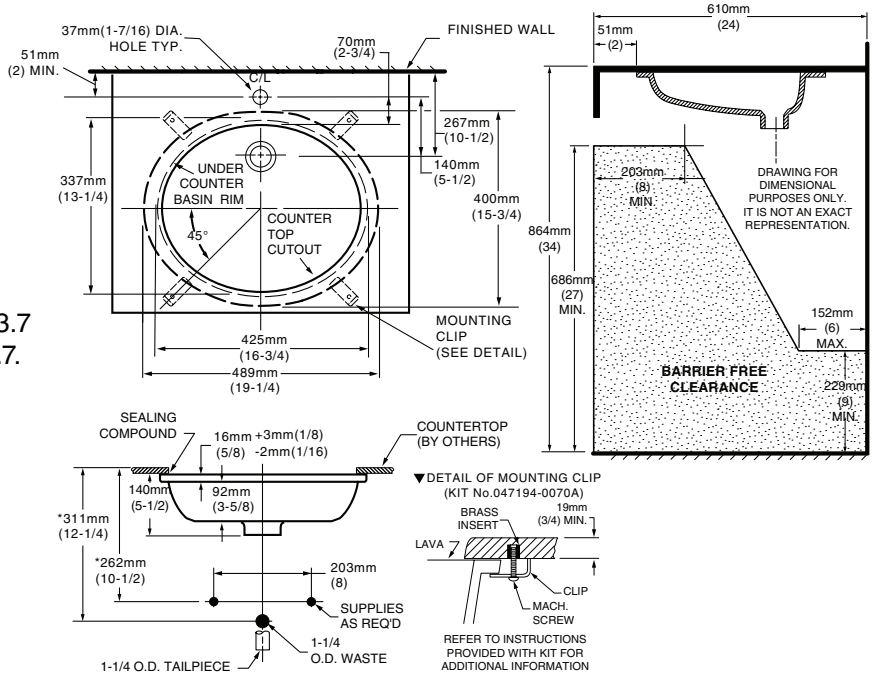
- Made from vitreous china
- Unglazed rim for under counter mount
- Rear overflow
- Supplied with mounting kit (047194-0070A) and template

❑ **9482.000**

Nominal Dimensions:
489 x 400mm
(19-1/4" x 15-3/4")

Bowl sizes:
425mm (16-3/4") wide
337mm (13-1/4") front to back
140mm (5-1/2") deep
102mm (4") bowl depth

Compliance Certifications - Meets or Exceeds the Following Specifications:
- ASME A112.19.2M for Vitreous China Fixtures
- CAN/CSA B45 series
- 1995 National Building Code, section 3.7 and CAN/CSA-B651-M90 and OBC 3.7.



To Be Specified:
- ❑ Color: ❑ White ❑ Bone ❑ Linen ❑ Silver ❑ Fawn Beige ❑ Black
- ❑ Faucet*:
- ❑ Faucet Finish:
- ❑ Supplies:
- ❑ 1-1/4" Trap:

* See faucet section for additional models available

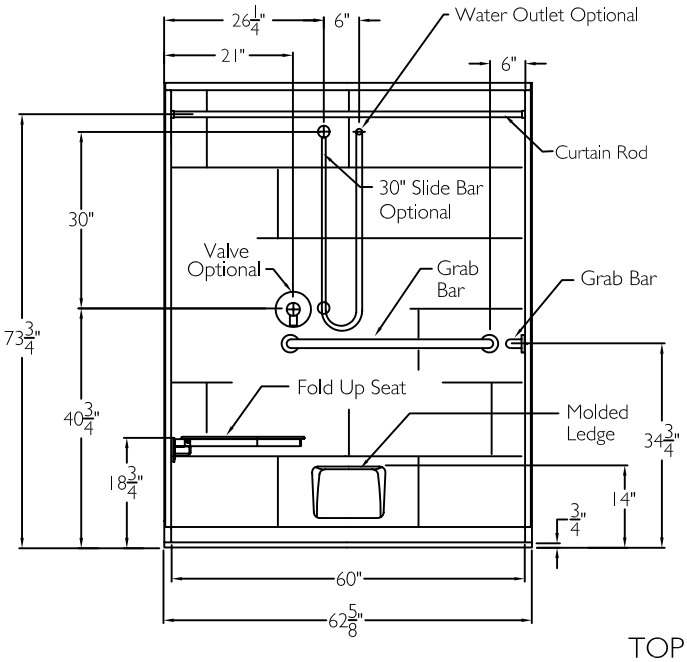
For Universal Design Options, top of counter may be mounted at 813mm (32") minimum from finished floor to meet ADA and ANSI A117.1 requirements. A 838mm (33") minimum mounting height is required for Ontario. Check local codes for heights and faucet handles requirements.

MEETS THE AMERICANS WITH DISABILITIES ACT GUIDELINES AND ANSI A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES - CHECK LOCAL CODES.
Countertop 864mm (34") from finished floor. Lavatory installed 51mm (2") MIN. from front edge of countertop. Countertop thickness to be 25mm (1") maximum.

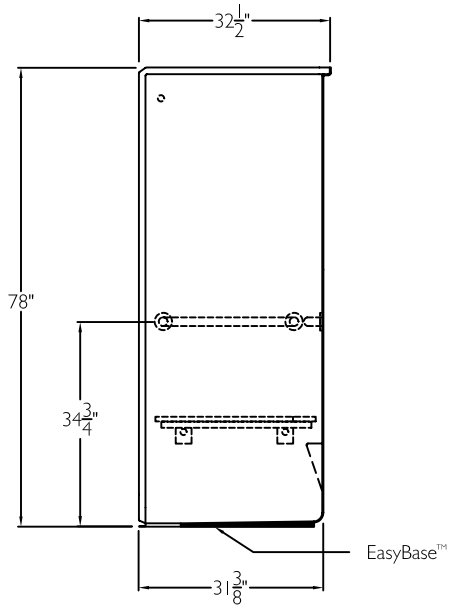
NOTES:
* DIMENSIONS SHOWN FOR LOCATION OF SUPPLIED AND "P" TRAP ARE SUGGESTED.
▼ UNDERCOUNTER MOUNTING KIT SUPPLIED WITH BASIN.
FITTINGS NOT INCLUDED WITH FIXTURE AND MUST BE ORDERED SEPARATELY.
USE ENCLOSED TEMPLATE FOR COUNTERTOP CUTOUT
SEALING COMPOUND SUPPLIED BY OTHERS.

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ANSI Standard A112.19.2. These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided pages.

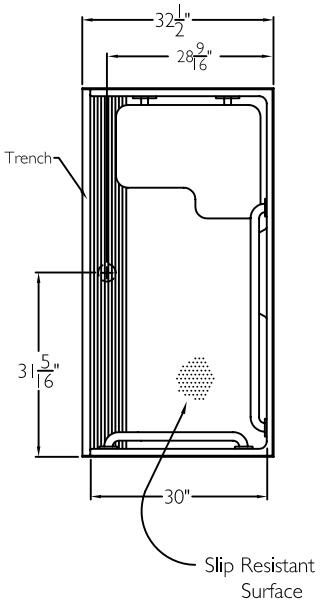
FRONT VIEW



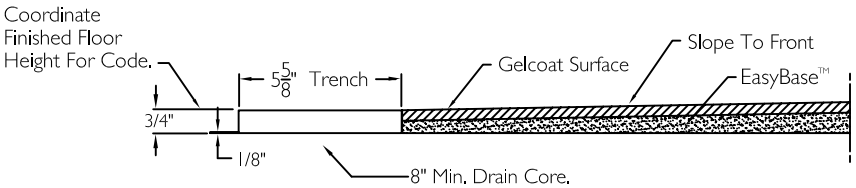
SIDE VIEW



TOP VIEW



CROSS SECTION OF THRESHOLD



comfortdesigns

SUBMITTAL

This shower enclosure shall be model XST 6232 TR .75, right, or left. Finished surface shall be of a sanitary grade polyester gelcoat exhibiting a minimal thickness of 15 dry mils and a finished cured Barcoal hardness of 80-90 as tested with ASTM D-2583. Unit construction shall be of a molded reinforced fiberglass with a 15% minimum fiberglass content.

The unit shall have outside dimensions of 62 5/8" x 32 1/2" x 78."

The unit shall meet ANSI Z124.1-2. ANSI A117.1, ADA, HUD, BOCA, NAHB UPC, and shall meet the requirements of the Southern Building Code.

The enclosure shall be equipped with the following accessories: 1) one 36" x 1 1/4" diameter 18 gauge white grab bar on the back wall, 2) one 24" x 1 1/4" 18 gauge white grab bar on the side wall, both with 1 1/2" statute clearance, secured with stainless steel bolts from the rear with 3" x 3" x 11 gauge metal mounting plates, 3) molded leg ledge, 4) tile finish, 5) one inch diameter, 18 gauge white curtain rod with receiver cups, 6) frameless 26" x 21" white HDPE fold up seat, 7) tri cell backing, 8) EasyBase™ self sustaining bottom, 9) integral front trench drain, 10) 3/4" threshold.

OPTIONAL ACCESSORIES:

Factory Plumbing Install Option: ☐ YES ☐ NO

☐ PB Pressure Balancing Mixing Valve (ADA / ANSI)

☐ HH Hand held shower assembly with slide bar, vacuum breaker and 60" hose (ADA / ANSI)

THIS UNIT FEATURES THE OUTSIDE DIMENSION OF 62 5/8" OF OVERALL WIDTH. THIS DOES NOT ALLOW FOR FULL ENCLOSURE OF THE BOLTS AND NUTS USED TO SECURE THE BARS AND SEAT IN PLACE. THE BOLT AND NUT COMBINATION SHOULD NOT PROTRUDE MORE THAN 3/4" ON EITHER SIDE OF THE SHOWER WALLS. THIS MAY REQUIRE THE NEED TO NOTCH STUDS TO ALOW BOLT CLEARANCE FOR A DRYWALL ENCLOSED FIRE WALL INSTALLATION. ADJUSTMENT OF THE WALL BOARD MAY BE NECESSARY TO PROVIDE CLEARANCE OF THE BOLT(S) WHILE MAINTAINING THE INTEGRITY OF THE DRYWALL ENCLOSED FIRE WALL ENCLOSURE.

NOTE: THIS UNIT WILL NOT ACCEPT A DOOR.

Job Name	Approved By	Name	Date	COMFORT DESIGNS
Project No	Architect			Model No. XST 6232 TR .75 L-Bar-1
Comfort Designs 435 Industrial Road Savannah, TN 38372 tel 800.443.7269 fax 731.925.4290 www.comfortdesignsbathware.com	Engineer			Drawing No. XST 6232 TR .75 WHBW WHSW FHDP WCR VP EB
	Rep			Date Issued. 4-3-12 — Drawing Rev. 10-7-15
	Wholesaler			Material. Gelcoat
	Comments			Color.
				Dimensions are in inches. Due to the nature of the materials dimensions may vary ± 1/2"

MultiChoice® Universal Pressure Balance Tub and Shower

TECK® COMMERCIAL

DELTA

Specification: (example)

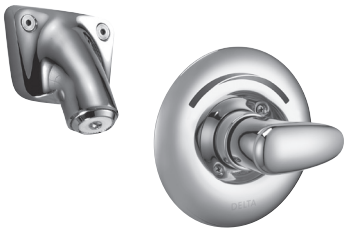
❑ **R10000-UNWS** ROUGH-IN only
- Concealed in-wall MultiChoice® Universal valve
- Back-to-back capability, Integral screwdriver stops
- **Heavy Duty forged brass** valve body
- 1/2" Universal inlets to accept 1/2" copper, 1/2" iron pipe, PEX or CPVC adaptors
- 1/2" Male thread inlets/outlets
- Inwall diverter valve

❑ **T13H _ _ _ - _ _ _ FINISH TRIM ONLY:**
- Pressure balancing cartridge with checks
- Polished chrome plated finish
- ADA compliant diverter handle
- Non-removeable red/blue temperature markings

and … with … (add product variation)
with … (add shower)
with … (add valve handle)

T13H153

T13H162



Engineer/Architect Approval

Model Specified:

Approval: Date:

TUB AND SHOWER DESCRIPTION	PRODUCT NO.
ROUGH-IN Valve	R10000-UNWS
FINISH TRIM Only	T13H _ _ _ – _ _ _

CSA® C US

PRODUCT VARIATION

✔	
❑	**0**
❑	**1** Shower Valve Only 
❑	**2** Tub and Shower 
❑	**3**
❑	**4**
❑	**5**
❑	**6**
❑	**7**
❑	**8**
❑	**9**

SHOWER

✔	
❑	**0** Specify "0" When No Shower Outlet Required
❑	**1**
❑	**2** 3-Function Touch-Clean® Showerhead, Arm, Set Screw Flange 
❑	**3** Showerhead, Arm, Set Screw Flange 
❑	**4**
❑	**5** Handshower with 2 Check Valves, 610mm (24") S/S Bar with ADA Slide 
❑	**6** 30° Vandal Resistant Cast Wallmount Showerhead 
❑	**7**
❑	**8** H_2Okinetic Technology® Showerhead, Arm, Set Screw Flange 
❑	**9**

HANDLE

✔	
❑	**0**
❑	**1**
❑	**2** 85mm (3.33") Metal Lever Handle 
❑	**3** 57mm (2.24") Lever Blade Handle 

SHOWER FLOW RATES

SHOWER #	ACTUAL @ 45 PSI (310 kPa)	MAXIMUM @ 80 PSI (552 kPa)
2	1.7 gpm (6.4 L/min)	2.0 gpm (7.6 L/min)
3	1.13 gpm (4.3 L/min)	1.5 gpm (5.7 L/min)
5	1.13 gpm (4.3 L/min)	1.5 gpm (5.7 L/min)
6	1.4 gpm (5.3 L/min)	1.5 gpm (5.7 L/min)
8	1.5 gpm (5.7 L/min)	1.5 gpm (5.7 L/min)

See DSP-B-R10000-HDF for additional Rough-In options.
Refer to www.specselect.com for individual models.

Note: Use this page front and back as a product submittal sheet.

DELTA

TECK® COMMERCIAL

MultiChoice® Universal Pressure Balance Tub and Shower

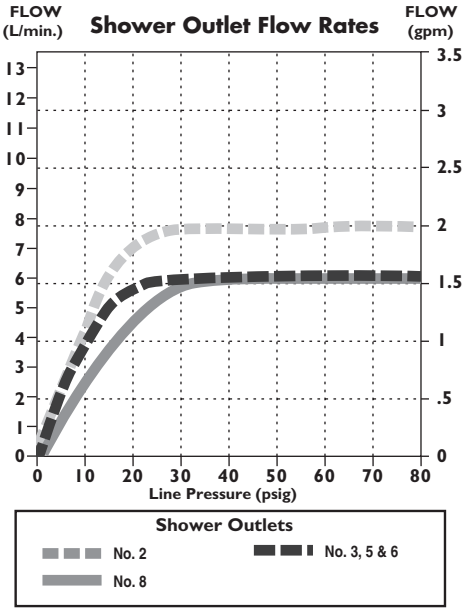
Approvals:

- ASME A112.18.1/CSA B125.1
- Indicates compliance to ICC/ANSI A117.1
- Pressure Balance Valve ASSE 1016
- Handshower back flow protection provided by two integral certified check valves in series, which operate independently, ASME A112.18.3

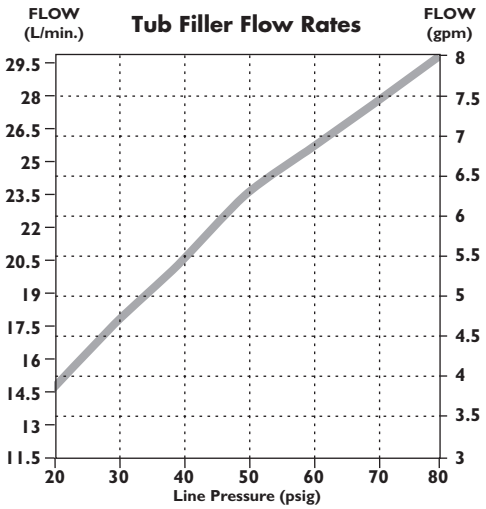
(Contact Delta Representative for State and/or Local Approvals.)

C SP US

FLOW RATE vs PRESSURE

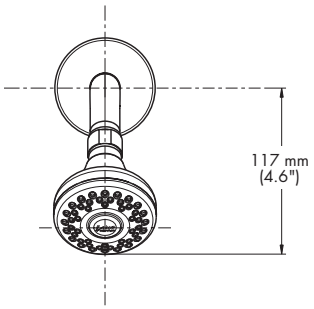


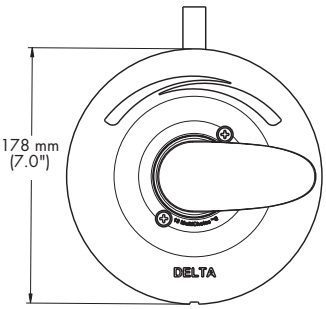
FLOW RATE vs PRESSURE



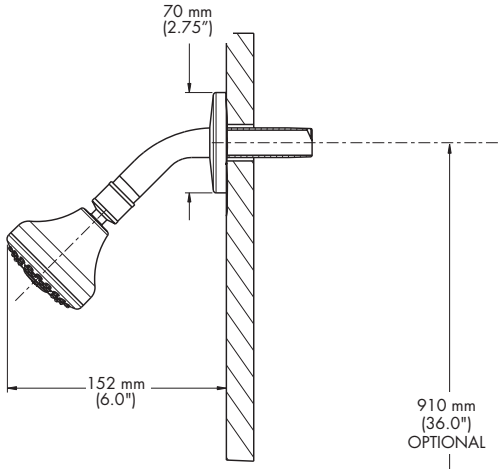
R10000-UNWS Rough-In with T13H132 Trim

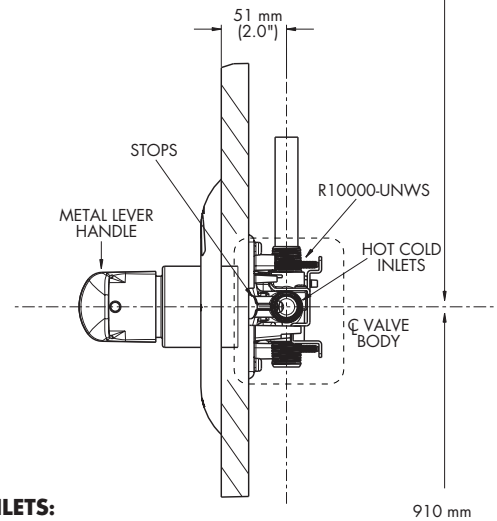
FRONT VIEW





SIDE VIEW





P/B VALVE INLETS:
1/2" Universal inlets accept 1/2" copper,
1/2" Iron pipe, PEX or CPVC adaptors
1/2" Male thread inlets/outlets

NOTE FOR SHOWER #6: Not for use as an anti-ligtature device.

PAUSE WARNING – FOR SHOWER #5

Plumbing Codes require that showerheads and handshowers provide a small but continuous flow of water (trickle) when in "PAUSE" mode. Because of this continuous flow, in certain circumstances pressure variations in the water line and/or changes in the position of the shower temperature control handle while in "PAUSE" mode could result in dramatic changes to the temperature of the water when the shower head or hand shower is returned to the "ON" position.

ALWAYS point the shower head away from yourself when returning to the "ON" position and feel the water with your hand before resuming your shower to ensure the water flow is not too hot or too cold. DO NOT allow children or others who might not understand this warning to use the "PAUSE" function.

Note: Measurements may vary ± 6mm (0.25")

Refer to www.specselect.com for individual models.

Note: Use this page front and back as a product submittal sheet.

T13H Series Tub and Shower Add-On Options

TECK® COMMERCIAL

DELTA®

DESCRIPTION	ADD-ON NUMBER		
T13H Tub/Shower Add-On Options	–		

A number from the Hose and Slide Bar columns must always be selected, even if it is "0".

CSA® C US

HOSE	✔
0 Always use "0" if **NO** selection is required from this column	☐
1	☐
2 1753 mm (69") Long CP Stainless Steel Hose – Stretches to 92" (2337 mm) (See Note 1) 	☐
3	☐
4	☐

SLIDE BAR	✔
0 Always use "0" if **NO** selection is required from this column	☐
1	☐
2	☐
3	☐
4	☐
5 914mm (36") S/S Slide Bar (See Note 2)	☐

Note:

(1) **Base Product** for the **HOSE, ETC.** option must include **SHOWER** option **No. 5**

(2) **Base Product** for S/S Slide Bar must include **SHOWER** option **No. 5**

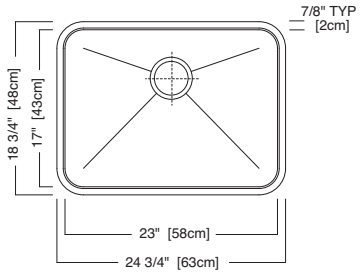
American Standard
Style That Works Better

14SB.251900.073

18 GAUGE STAINLESS STEEL KITCHEN SINK 24 3/4"

❑ **Undermount Series**

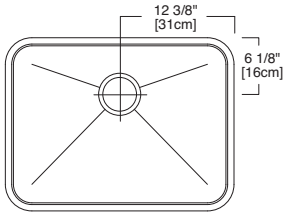
- 18 Gauge Stainless Steel
- 18-10 Chrome Nickel content
- Single bowl sink
- Installation hardware, template and instructions included
- **Waste fitting included**
- **30" cabinet required**



Nominal Dimensions:
24 3/4" x 18 3/4" x 9"

Bowl Size:
23" wide
17" front to back
9" deep

Wastehole Location:



Compliance Certifications:

IMPORTANT: Dimensions of fixtures are nominal and may vary within the range of tolerances established by ASME A112.19.3
These measurements are subject to change or cancellation. No responsibility is assumed for use of superseded or voided leaflet.

To Be Specified:

❑ 8443.101500.075  Stainless steel mesh colander

❑ 8445.211500.075  Stainless steel bottom grid